

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.

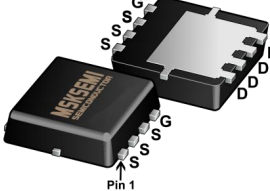
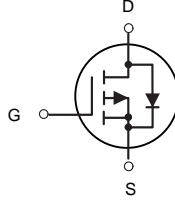
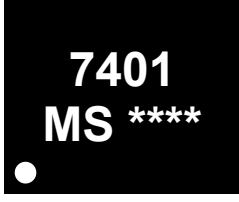
General Features

- $V_{DS} = -30V, I_D = -50A$
- $R_{DS(ON)} < 15m\Omega @ V_{GS} = -10V$
- $R_{DS(ON)} < 25m\Omega @ V_{GS} = -4.5V$
- 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

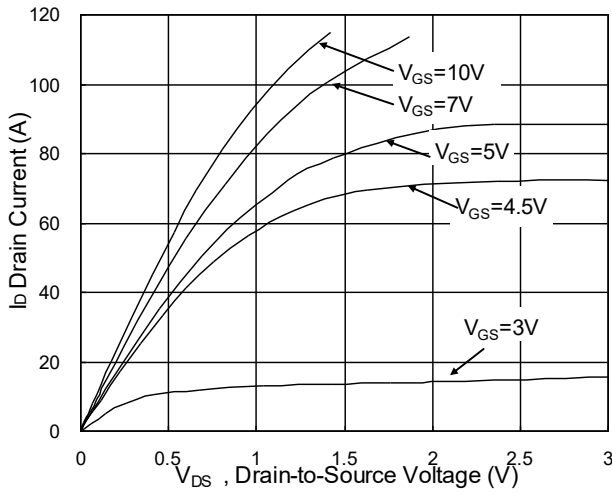


Fig.1 Typical Output Characteristics

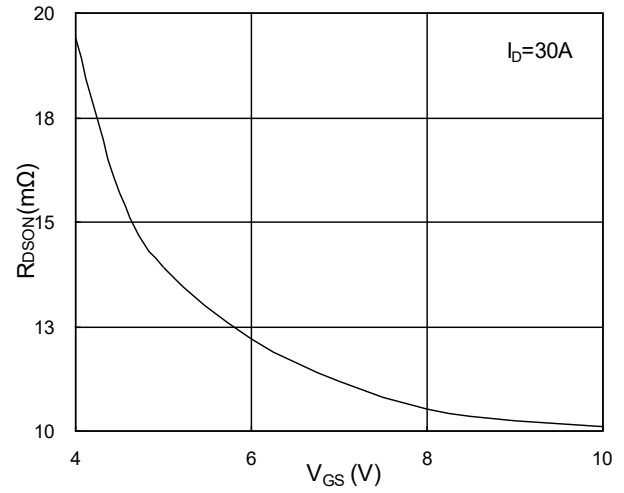


Fig.2 On-Resistance vs. G-S Voltage

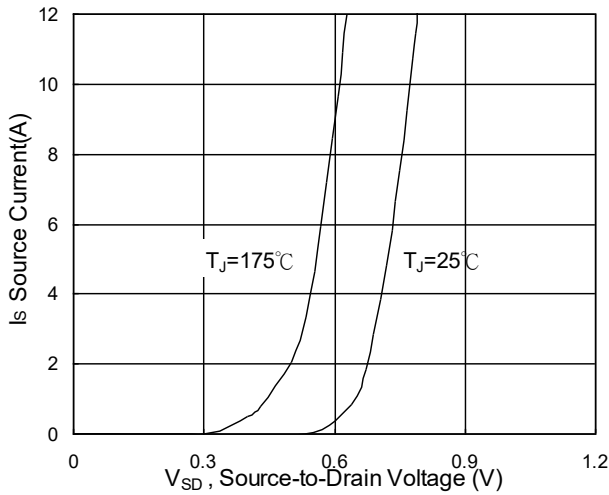


Fig.3 Forward Characteristics of Reverse

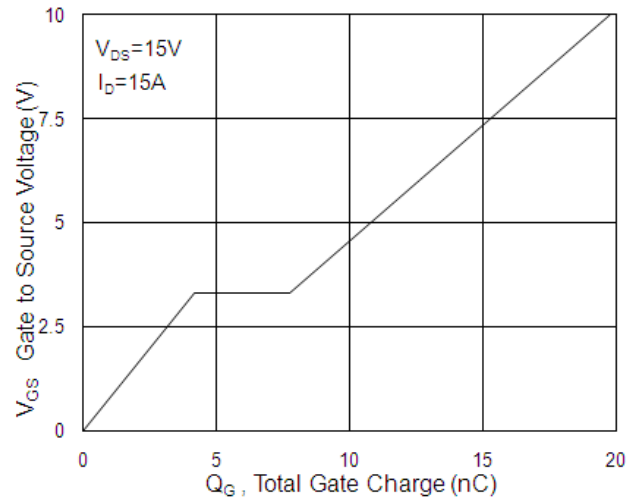


Fig.4 Gate-Charge Characteristics

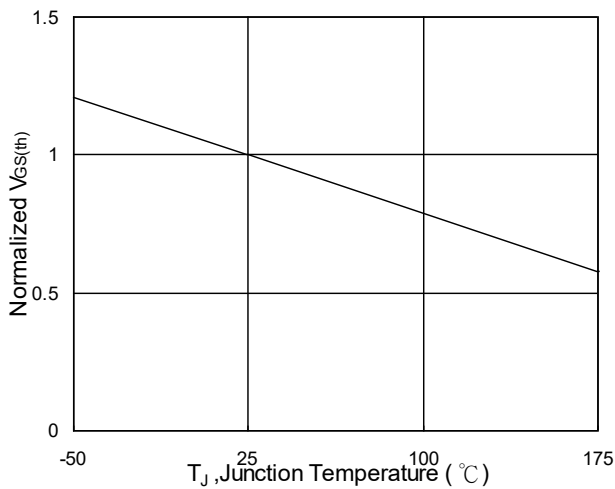


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

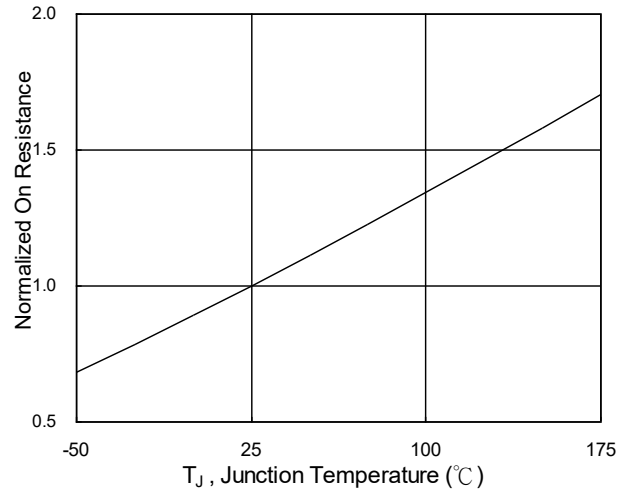


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

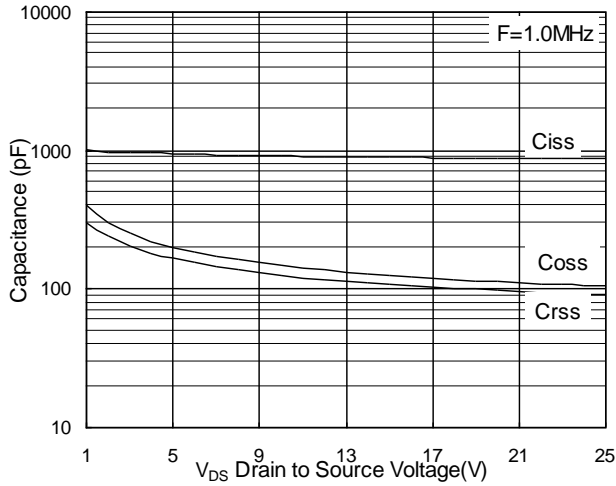


Fig.7 Capacitance

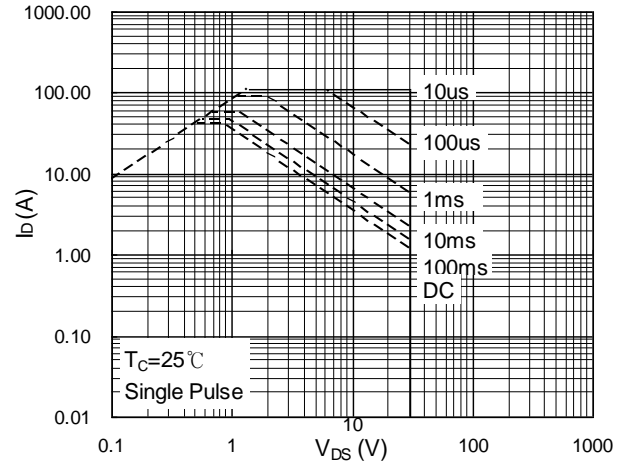


Fig.8 Safe Operating Area

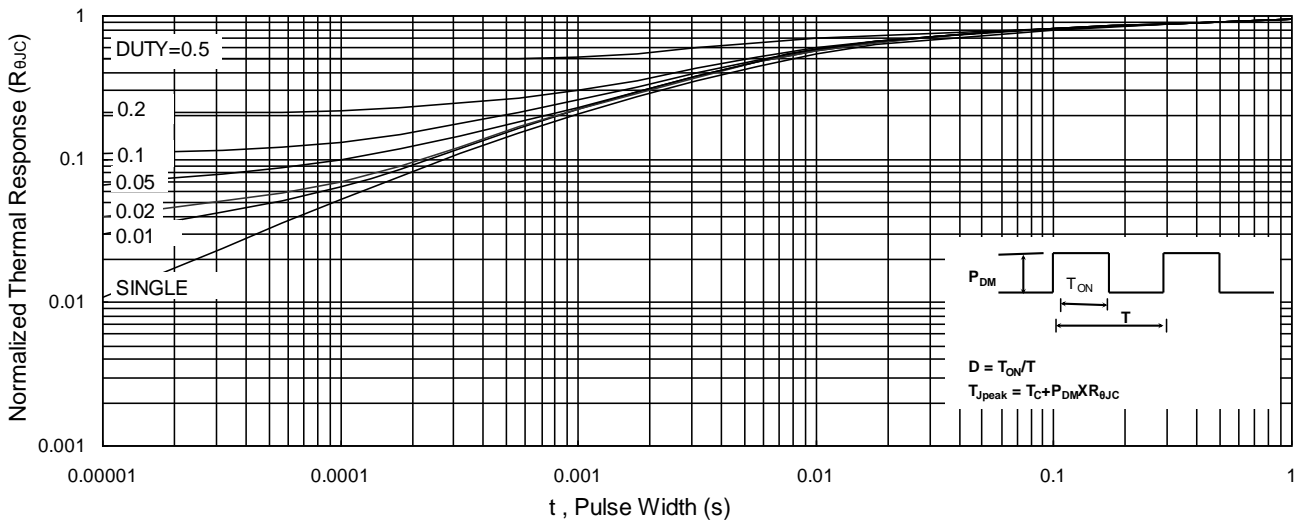


Fig.9 Normalized Maximum Transient Thermal Impedance

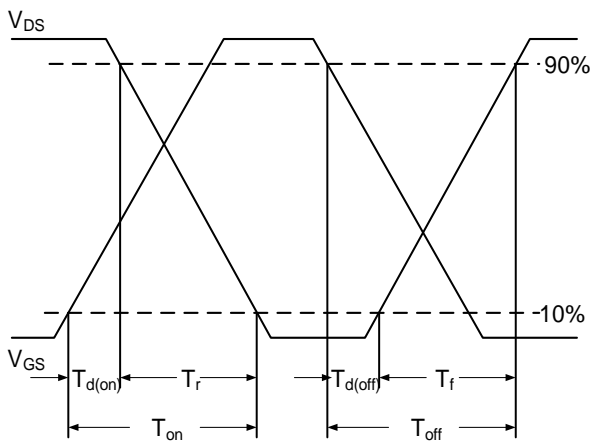


Fig.10 Switching Time Waveform

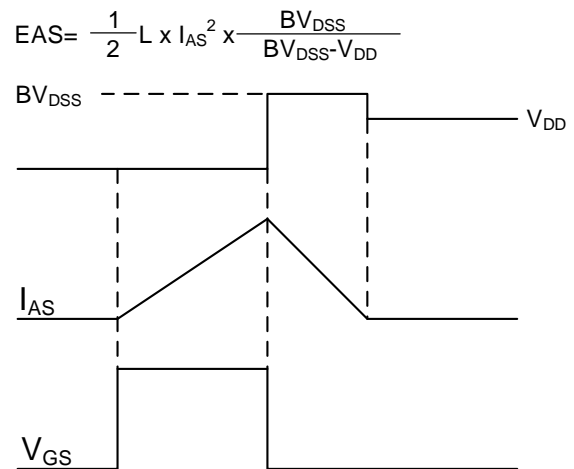
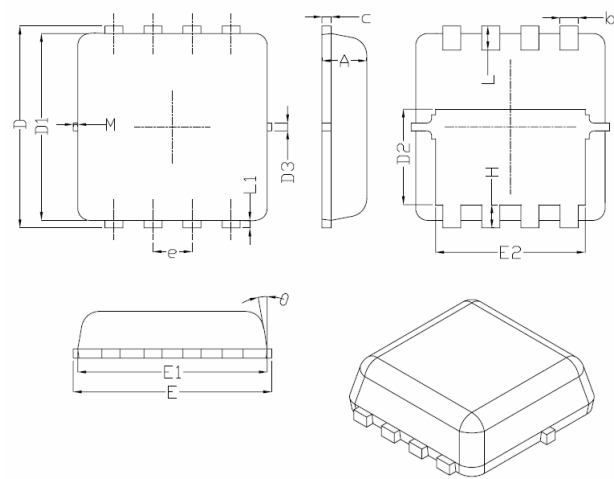


Fig.11 Unclamped Inductive Switching Waveform

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°	12°

REELSPECIFICATION

P/N	PKG	QTY
MSK50P03NF	DFN3X3-8L	5000

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