

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

5N10T-MS

Product specification

General Description

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

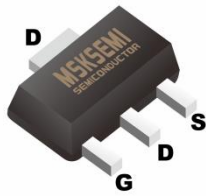
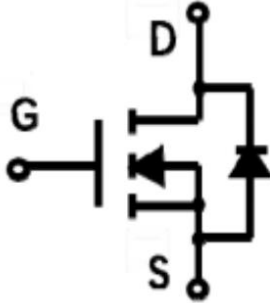

Product Summary

V_{DS}	100V
I_D	5.0A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 140 mohm

Applications

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor

Reference News

PACKAGE OUTLINE	PIN CONFIGURATION	Marking
 SOT-89		

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	100	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^{\circ}\text{C}$	I_D	5.0	A
	$T_A=70^{\circ}\text{C}$		2.4	
Pulsed Drain Current ^A		I_{DM}	21	A
Total Power Dissipation @ $T_A=25^{\circ}\text{C}$		P_D	1.2	W
Thermal Resistance Junction-to-Ambient ^B		$R_{\theta JA}$	104	$^{\circ}\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^{\circ}\text{C}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.0	1.8	3.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =3.0A		110	140	mΩ
		V _{GS} = 4.5V, I _D =2.0A		160	300	
Diode Forward Voltage	V _{SD}	I _S =3.0A, V _{GS} =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I _S				3.0	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHZ		206		pF
Output Capacitance	C _{oss}			29		
Reverse Transfer Capacitance	C _{rss}			1.4		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =50V, I _D =3.0A		4.3		nC
Gate-Source Charge	Q _{gs}			1.5		
Gate-Drain Charge	Q _{gd}			1.1		
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =50V, I _D =3.0A, R _{GEN} =2Ω		14.7		ns
Turn-on Rise Time	t _r			3.5		
Turn-off Delay Time	t _{D(off)}			20.9		
Turn-off fall Time	t _f			2.7		
Reverse recovery time	t _{rr}	I _S =3A, di/dt=100 A/ μ s		32		ns
Reverse recovery charge	Q _{rr}			39		nC
Peak reverse recovery current	I _{rrm}			2.1		A

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Performance Characteristics

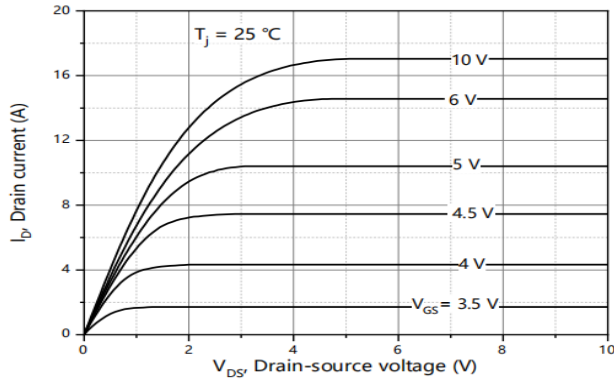


Figure1. Output Characteristics

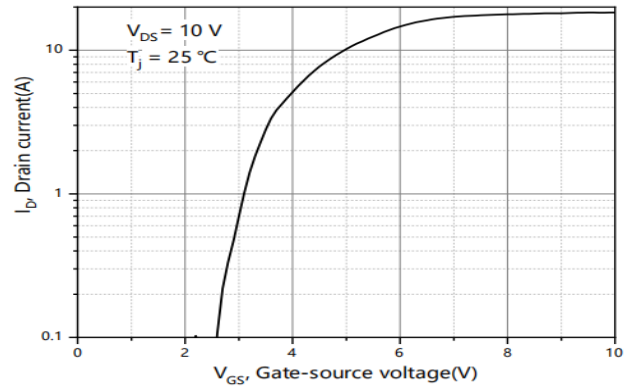


Figure2. Transfer Characteristics

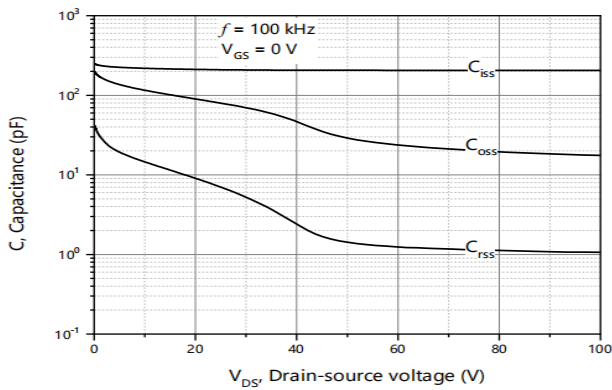


Figure3. Capacitance Characteristics

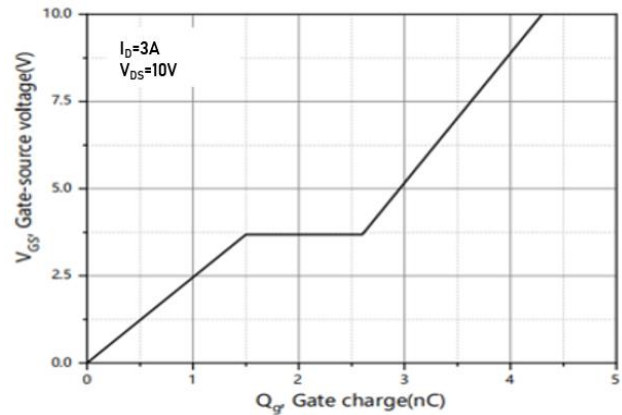


Figure4. Gate Charge

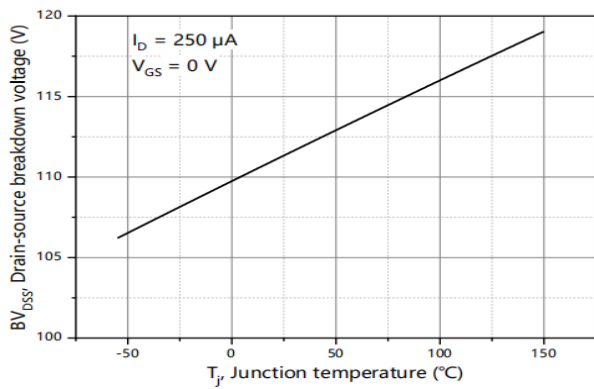


Figure5. Drain-Source breakdown voltage

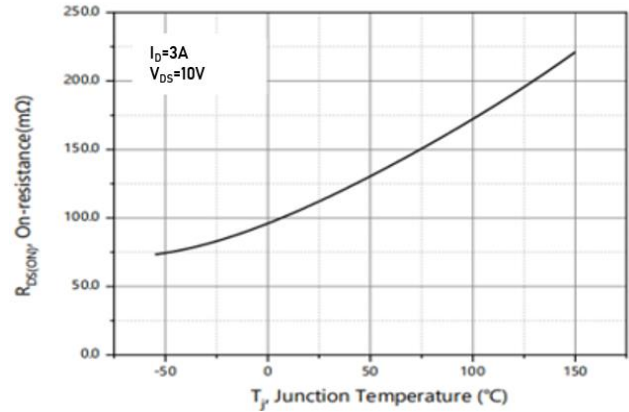


Figure6. Drain-Source on Resistance

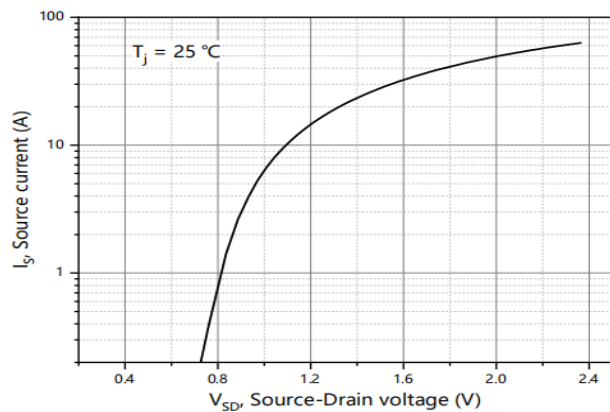


Figure7. Forward characteristic of body diode

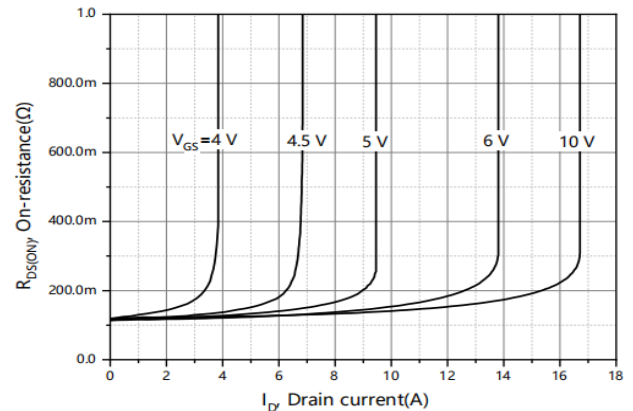


Figure8. Drain-source on-state resistance

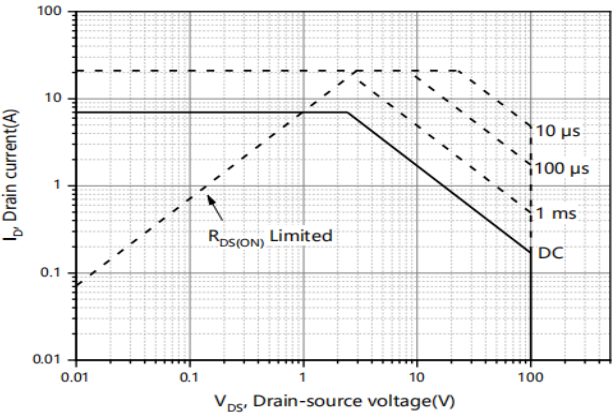


Figure9. Safe Operation Area $T_A=25^\circ\text{C}$

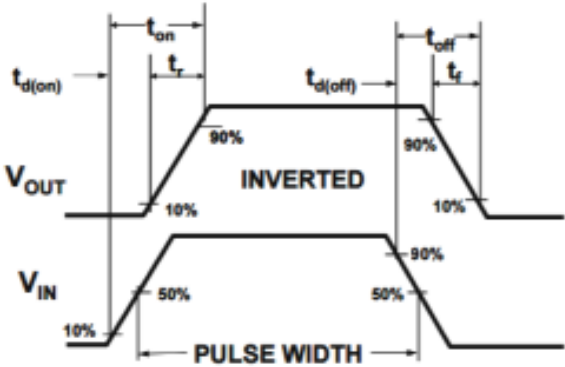
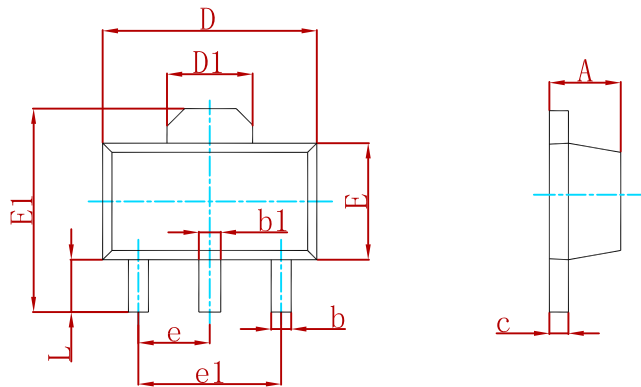
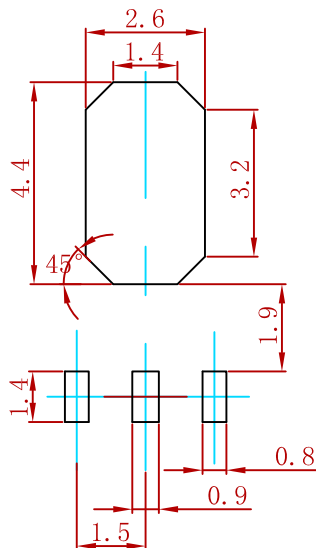


Figure10. Switching wave

PACKAGE MECHANICAL DATA


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

Suggested Pad Layout


Note:
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
5N10T-MS	SOT-89	1000

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