5N10

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

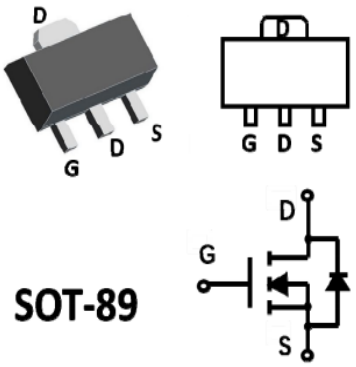
- V_{DS} 100V
- I_D 5.0A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜140 mohm

General Description

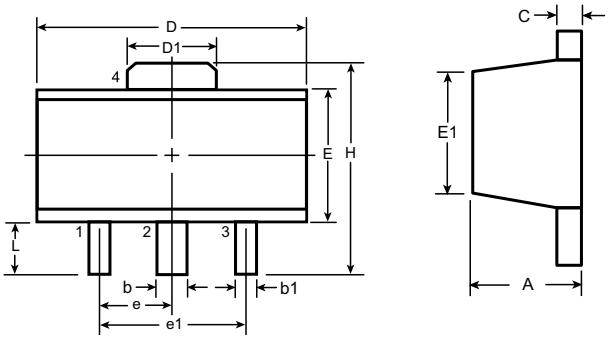
- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

Applications

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



SOT-89 PACKAGE OUTLINE



Top View Side View

Symbol		A	b	b1	C	D	D1	E	E1	e	e1	H	L
Dimensions (mm)	MIN	1.40	0.44	0.36	0.3	4.40	1.50	2.29	2.00[f]	1.50 BSC	3.00 BSC	3.94	0.89
	NOM	-	-	-	-	-	-	-	-			-	-
	MAX	1.60	0.56	0.48	0.5	4.60	1.75	2.60	2.29			4.25	1.20

Dimensions in mm

■ **Absolute Maximum Ratings** (T_A=25℃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℃	I_D	5.0	A
	T_A=70℃		2.4	
Pulsed Drain Current [A]		I_{DM}	21	A
Total Power Dissipation @ T_A=25℃		P_D	1.2	W
Thermal Resistance Junction-to-Ambient [B]		$R_{\theta JA}$	104	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

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■ **Electrical Characteristics** (T_J=25℃ 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/μs		32		ns
Reverse recovery charge	Q_{rr}			39		nC
Peak reverse recovery current	I_{rrm}			2.1		A

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

RATING AND CHARACTERISTIC CURVES (5N10)

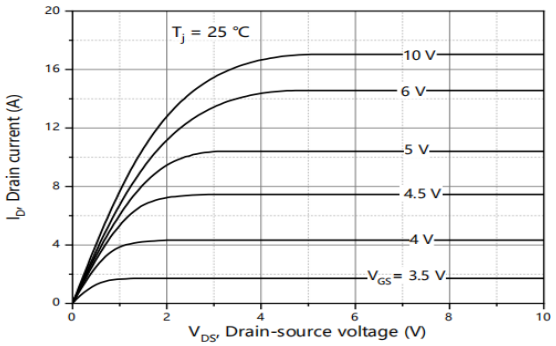

Figure1. Output Characteristics

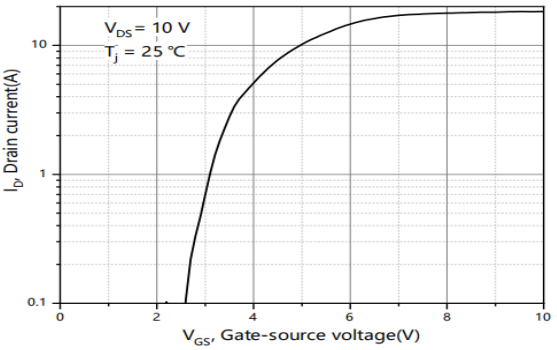

Figure2. Transfer Characteristics

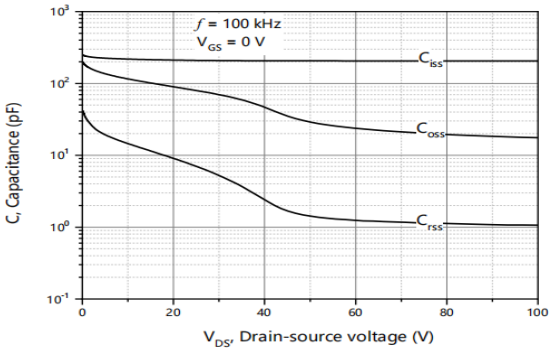

Figure3. Capacitance Characteristics

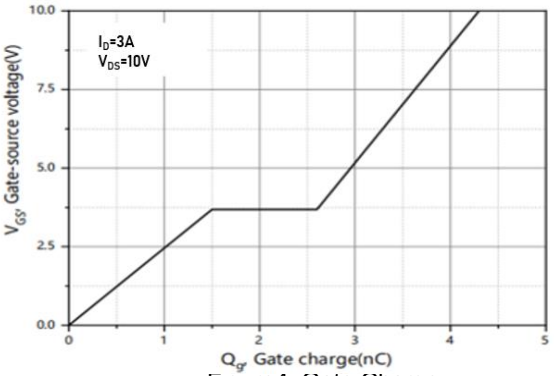

Figure4. Gate Charge

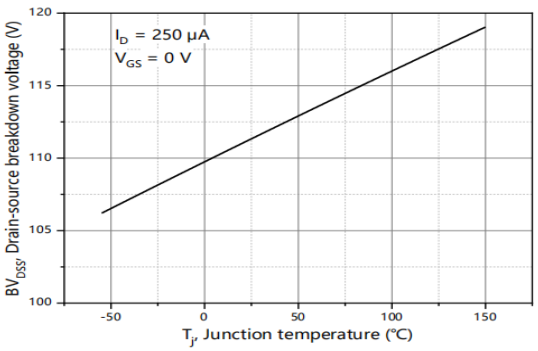

Figure5. Drain-Source breakdown voltage

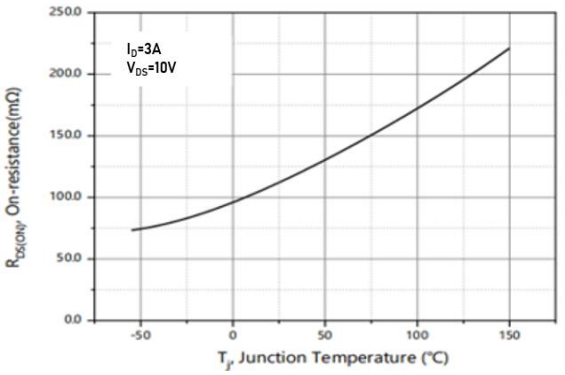

Figure6. Drain-Source on Resistance

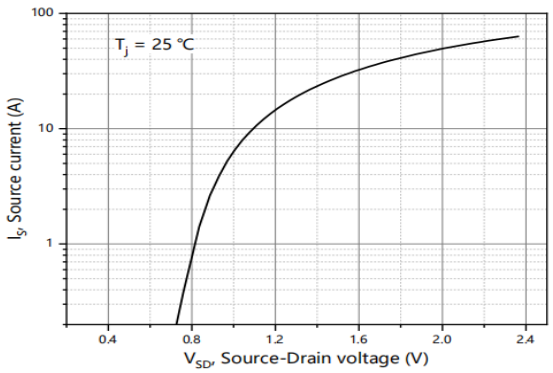

Figure7. Forward characteristic of body diode

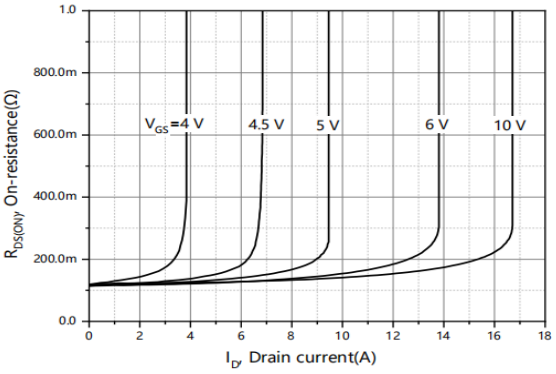

Figure8. Drain-source on-state resistance

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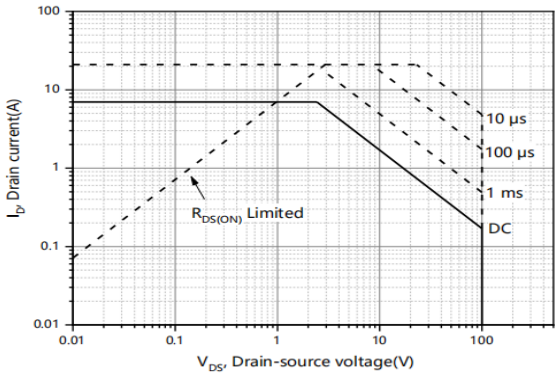

Figure9. Safe Operation Area T_A=25 ℃

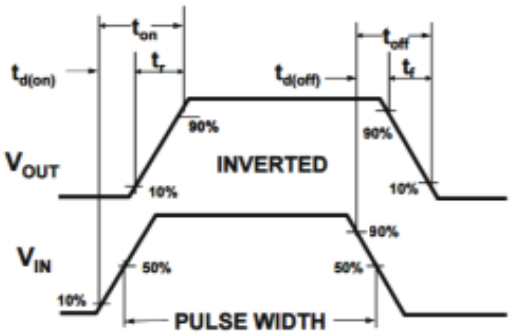

Figure10. Switching wave