

DN2300

DN2300 N-Channel Enhancement MOSFET

General description

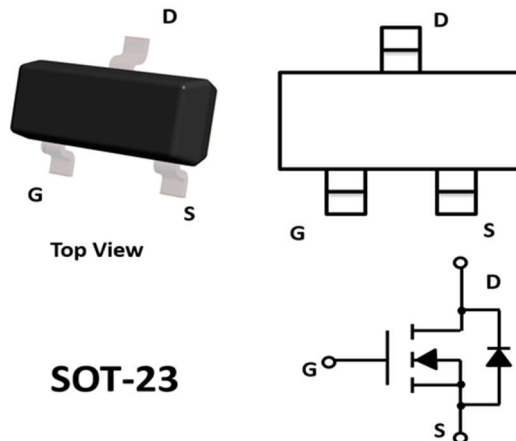
N-Channel Enhancement Mode Field Effect Transistor

FEATURES

- Pb-Free, RoHS Compliant $V_{DS}=20V$
- $I_D=6A$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 18 m Ω
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) < 22 m Ω
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) < 39 m Ω
- Trench Power LV MOSFET technology
- High Power and current handling capability

APPLICATIONS

- PWM application
- Load switch



SOT-23

Device Marking Code:

Device Type	Device Marking
DN2300	2300 or AE9T

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ\text{C}$ @ Steady State	6
		$T_A=70^\circ\text{C}$ @ Steady State	5.4
Pulsed Drain Current ^A	I_{DM}	27	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	P_D	1.2	W
Thermal Resistance Junction-to-Ambient @ Steady State ^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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V, T_C=25^\circ C$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}= \pm 10V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}= V_{GS}, I_D=250\mu A$	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}= 4.5V, I_D=6.8A$		15	18	m Ω
		$V_{GS}= 2.5V, I_D=3.0A$		19	22	
		$V_{GS}= 1.8V, I_D=2.5A$		27	39	
Diode Forward Voltage	V_{SD}	$I_S=6A, V_{GS}=0V$			1.2	V
Maximum Body-Diode Continuous Current	I_S				6	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		900		pF
Output Capacitance	C_{oss}			165		
Reverse Transfer Capacitance	C_{rss}			75		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=10V, I_D=6A$		9.2		nC
Gate Source Charge	Q_{gs}			1.7		
Gate Drain Charge	Q_{gd}			2.9		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DD}=10V, R_L=1.5\Omega, R_{GEN}=3\Omega$		12		ns
Turn-on Rise Time	t_r			52		
Turn-off Delay Time	$t_{D(off)}$			17		
Turn-off Fall Time	t_f			10		

Note :

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 Characteristics

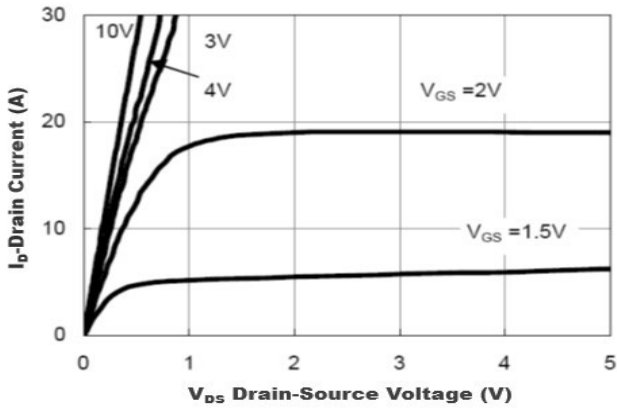


Figure1. Output Characteristics

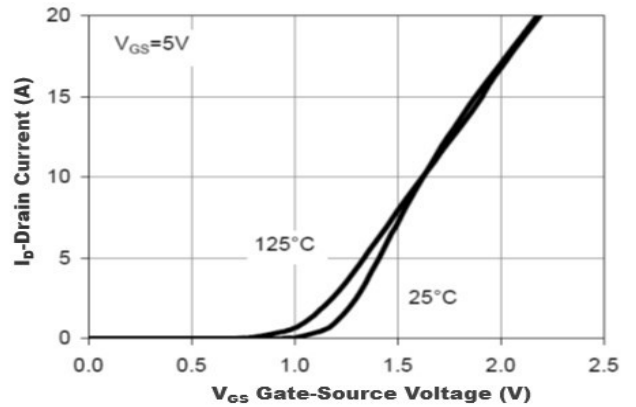


Figure2. Transfer Characteristics

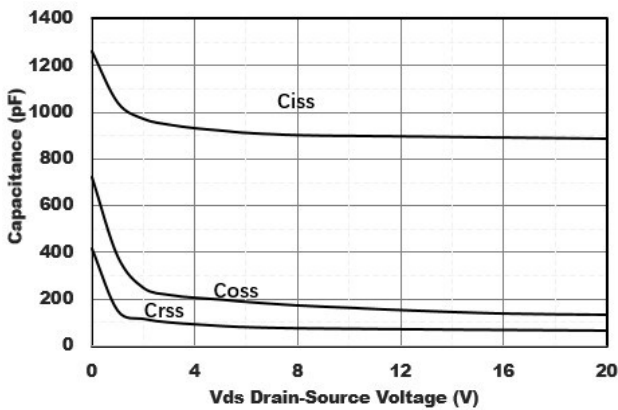


Figure3. Capacitance Characteristics

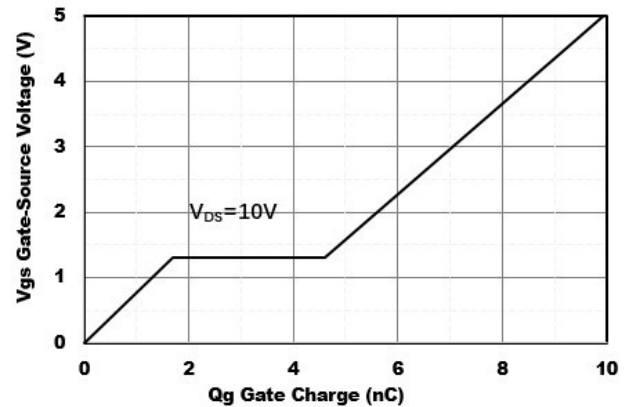


Figure4. Gate Charge

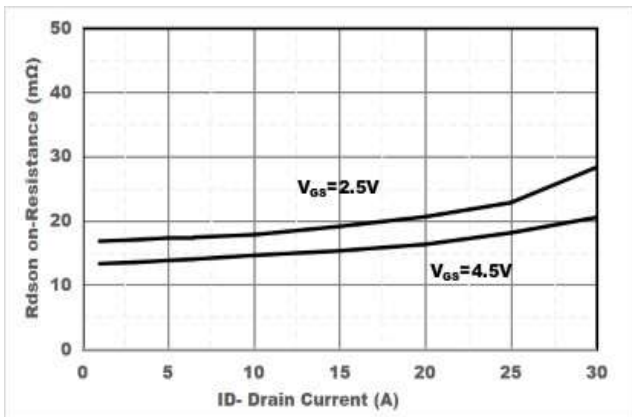


Figure5. Drain-Source on Resistance

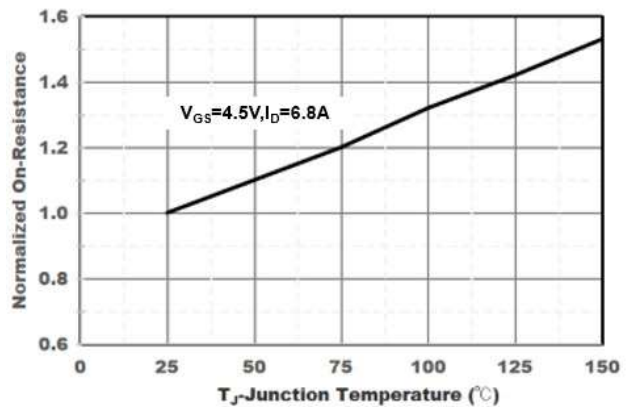


Figure6. Drain-Source on Resistance



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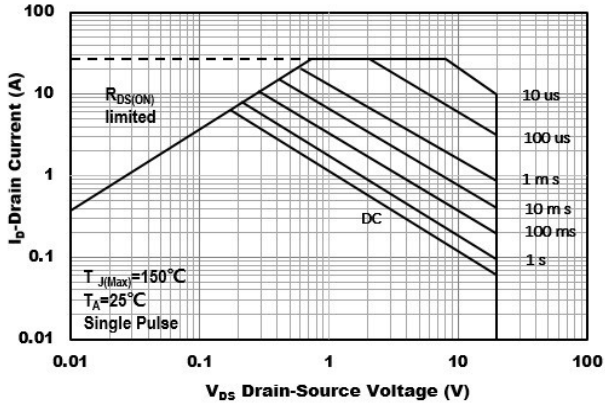


Figure7. Safe Operation Area

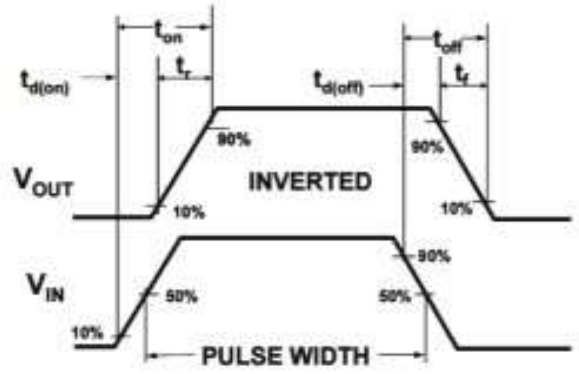
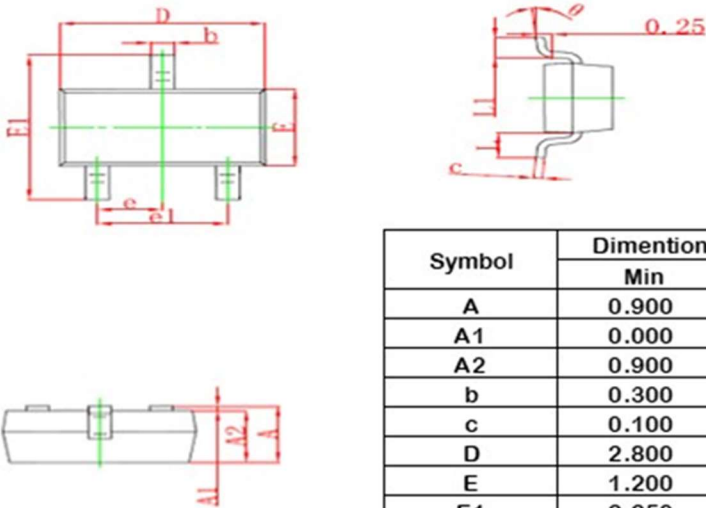


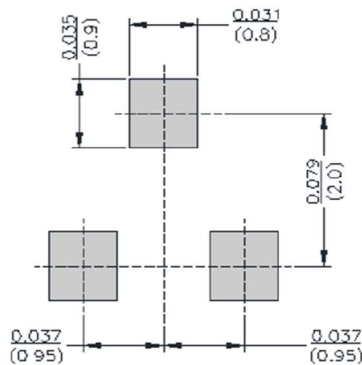
Figure8. Switching wave

SOT-23 Package information



Symbol	Dimensions in Millimeter		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950Type		0.037Type	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.220REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



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