

# DN2300

## DN2300 N-Channel Enhancement MOSFET

### General description

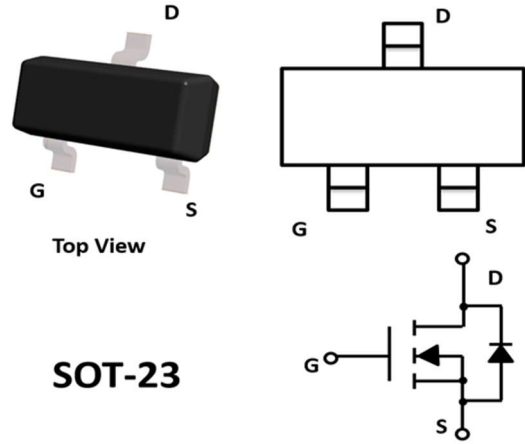
N-Channel Enhancement Mode Field Effect Transistor

### FEATURES

- Pb-Free, RoHS Compliant  $V_{DS}=20V$
- $I_D=6A$
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) < 18 m $\Omega$
- $R_{DS(ON)}$ ( at  $V_{GS}=2.5V$ ) < 22 m $\Omega$
- $R_{DS(ON)}$ ( at  $V_{GS}=1.8V$ ) < 39 m $\Omega$
- 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	$V_{GS}$	$\pm 10$	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 <sup>A</sup>	$I_{DM}$	27	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	1.2	W
Thermal Resistance Junction-to-Ambient @ Steady State <sup>B</sup>	$R_{\theta JA}$	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
<b>Static Parameter</b>						
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	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}= \pm 10V, V_{DS}=0V$			$\pm 100$	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 $\Omega$
		$V_{GS}= 2.5V, I_D=3.0A$		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
<b>Dynamic Parameters</b>						
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		
<b>Switching Parameters</b>						
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

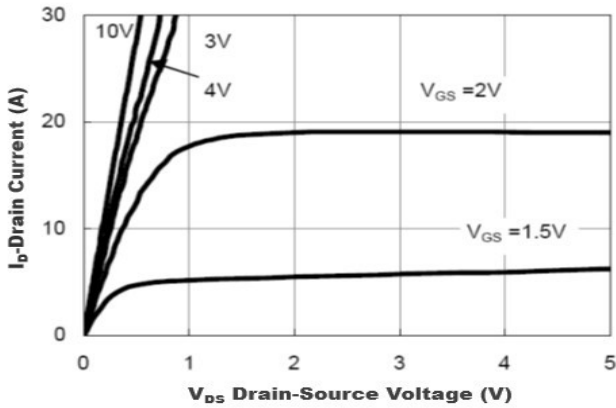


Figure1. Output Characteristics

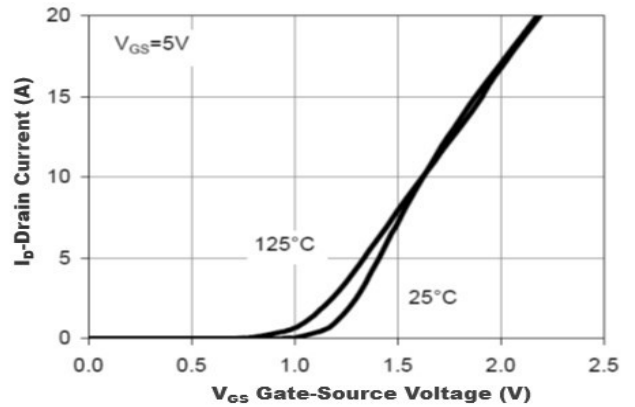


Figure2. Transfer Characteristics

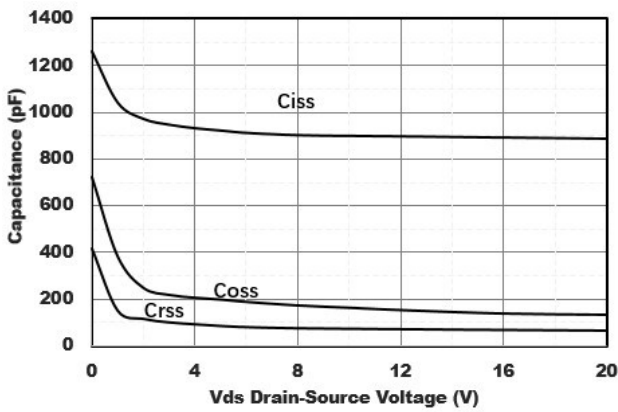


Figure3. Capacitance Characteristics

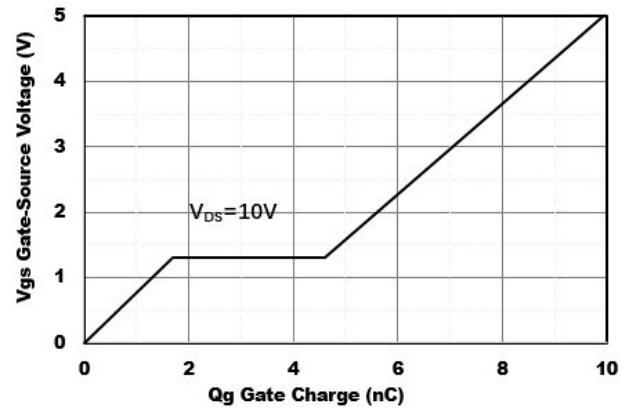


Figure4. Gate Charge

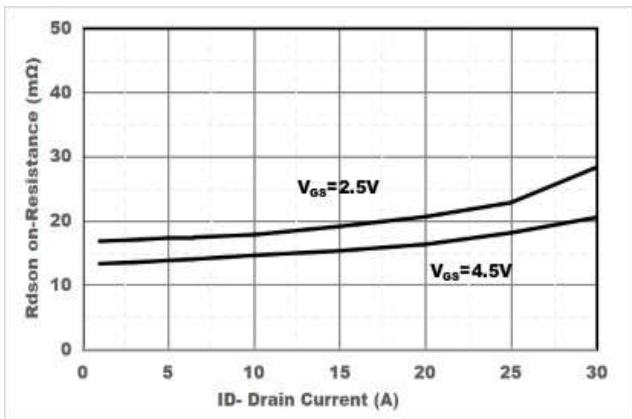


Figure5. Drain-Source on Resistance

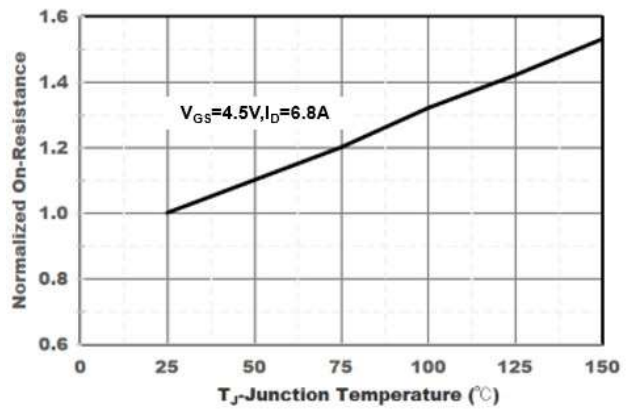


Figure6. Drain-Source on Resistance



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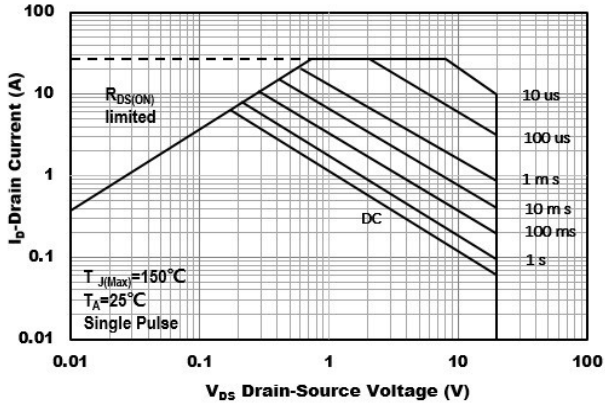


Figure7. Safe Operation Area

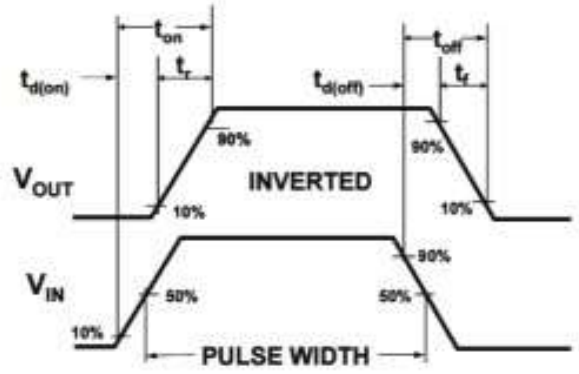
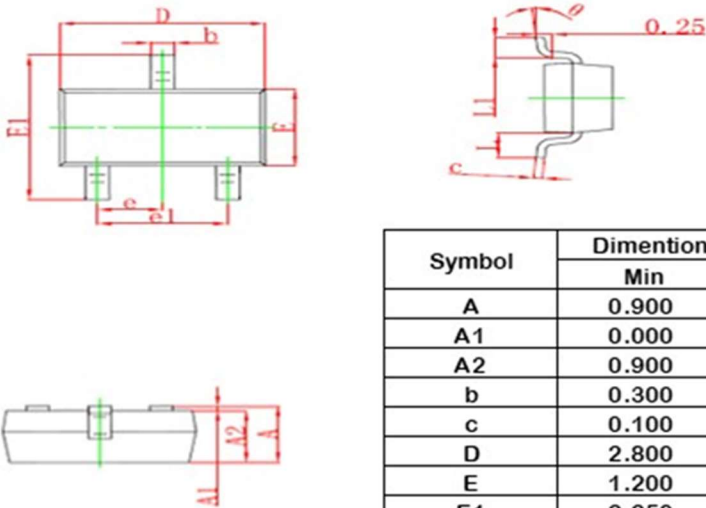


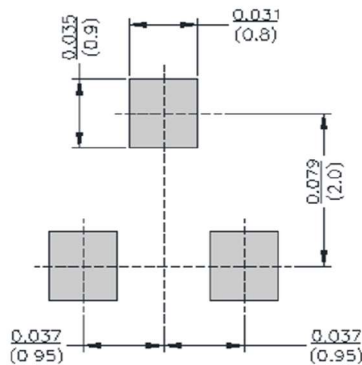
Figure8. Switching wave

## 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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