

DN2302

DN2302 N-Channel MOSFET

General description

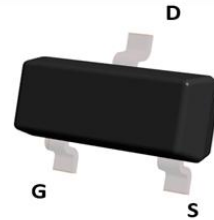
N-Channel MOSFET

FEATURES

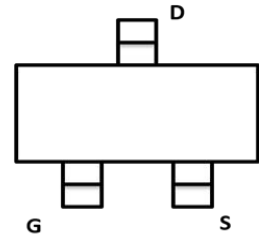
- $V_{DS}=20V$
- $I_D=4.5A$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 35 m Ω
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) < 45 m Ω
- Trench Power MOSFET technology
- High Power and current handling capability
- High density cell design for low $R_{DS(ON)}$

APPLICATIONS

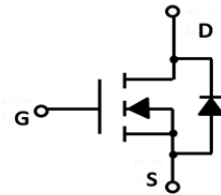
- DC-DC Converters
- LED Driver
- Switching Circuits



Top View



SOT-23



Device Marking Code:

Device Type	Device Marking
DN2302	S2 or A2SHB

Absolute Maximum Ratings

Parameters	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	4.5	A
Pulsed Drain Current (note 1)	I_{DM}	18	A
Maximum Power Dissipation	P_D	1.2	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	100	$^{\circ}C/W$
Junction and Storage Temperature	T_J, T_{STG}	-50~+150	$^{\circ}C$

DN2302

Electrical Characteristics

Parameters	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	--	--	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$	--	--	1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	--	--	± 100	nA
Gate threshold voltage (note 3)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.6	1.0	V
Drain-source on-resistance (note 3)	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 4A$	--	28	35	m Ω
		$V_{GS} = 3.3V, I_D = 2A$	--	32	40	m Ω
		$V_{GS} = 2.5V, I_D = 1A$	--	36	45	m Ω
Diode forward voltage (note 3)	V_{SD}	$I_S = 2A, V_{GS} = 0V$	--	0.74	1.2	V

Dynamic Characteristics (note4)						
Input Capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	--	280	--	pF
Output Capacitance	C_{oss}		--	46	--	pF
Reverse Transfer Capacitance	C_{rss}		--	42	--	pF
Switching Characteristics (note 4)						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 10V, I_D = 4A, R_G = 3.3\Omega, V_{GS} = 4.5V$	--	11	--	ns
Turn-on rise time	t_r		--	35	--	ns
Turn-off delay time	$t_{d(off)}$		--	25	--	ns
Turn-off fall time	t_f		--	32	--	ns
Total Gate Charge	Q_g	$V_{DS} = 10V, I_D = 3A, V_{GS} = 5V$	--	4.7	--	nC
Gate-Source Charge	Q_{gs}		--	0.6	--	nC
Gate-Drain Charge	Q_{gd}		--	1.7	--	nC

Note :

- 1) Repetitive rating: Pulse width limited by maximum junction temperature
- 2) Surface Mounted on FR4 board, $t \leq 10$ sec.
- 3) Pulse test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

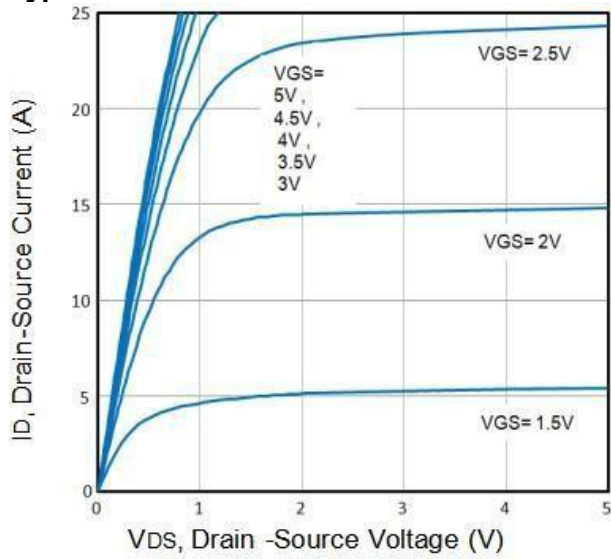


Fig1. Typical Output Characteristics

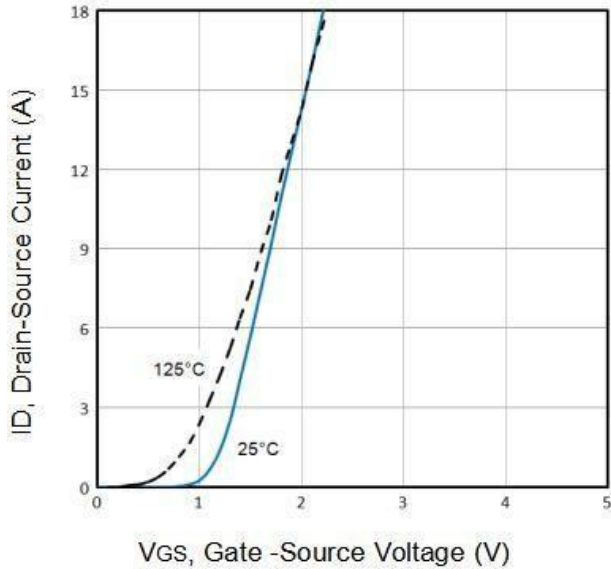


Fig3. Typical Transfer Characteristics

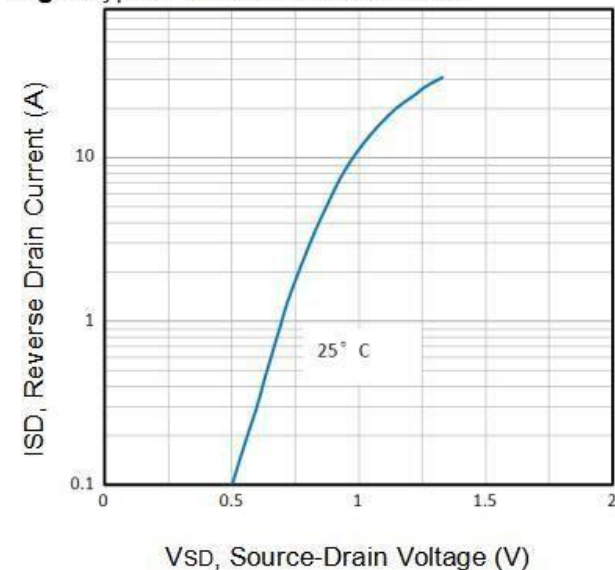


Fig5. Typical Source-Drain Diode Forward Voltage

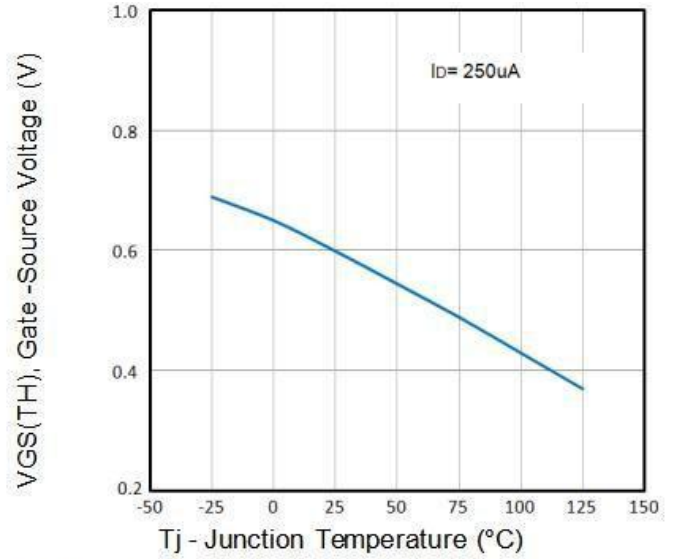


Fig2. Normalized Threshold Voltage Vs. Temperature

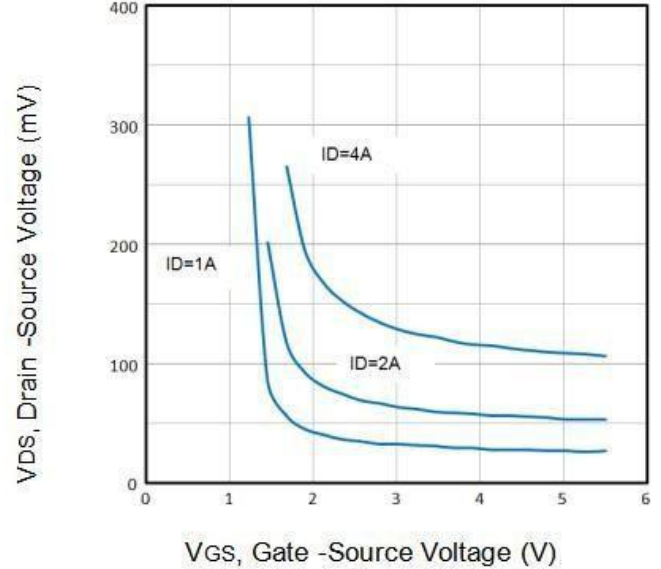


Fig4. Drain-Source Voltage vs Gate-Source Voltage

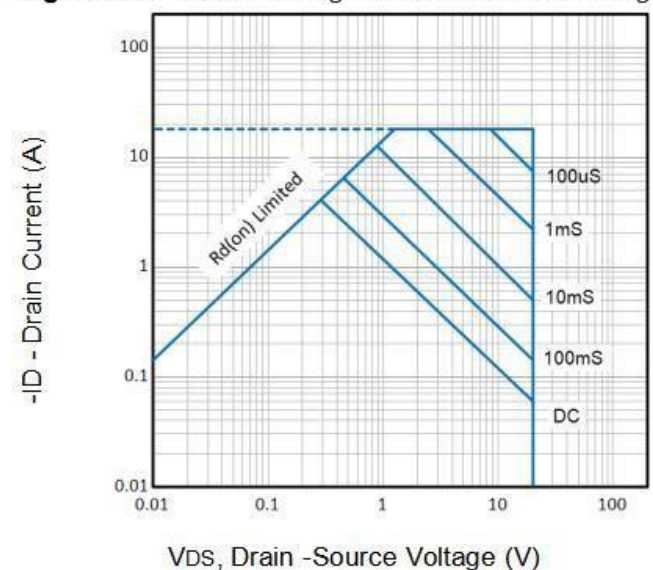


Fig6. Maximum Safe Operating Area



DN2302

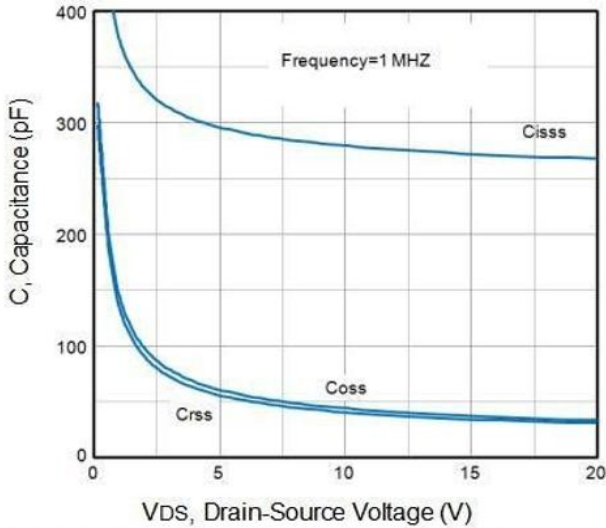


Fig7. Typical Capacitance Vs. Drain-Source Voltage

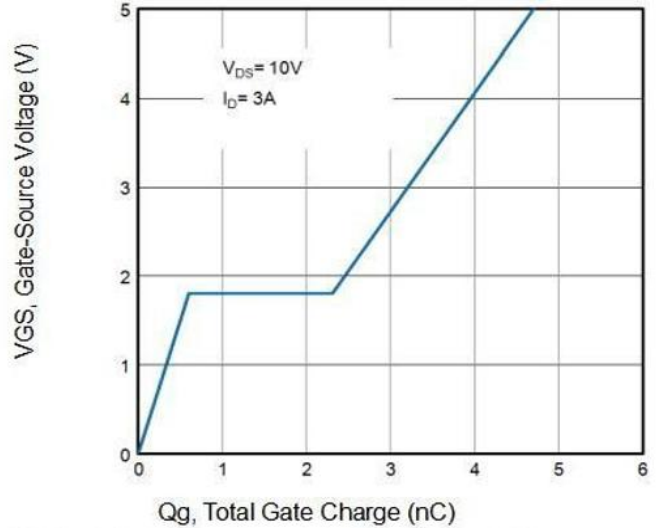
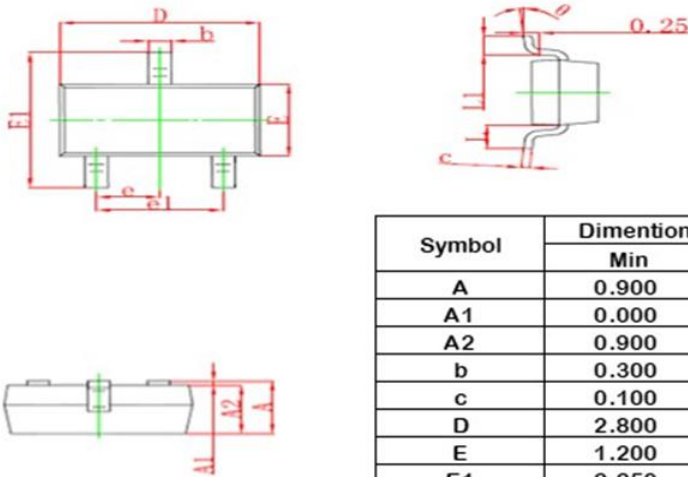


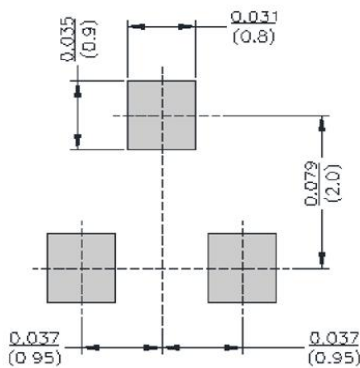
Fig8. Typical Gate Charge Vs. Gate-Source Voltage

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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