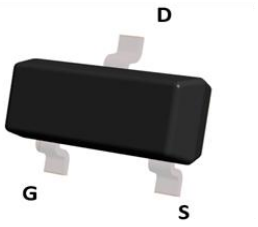
DN2302
N-Channel MOSFET

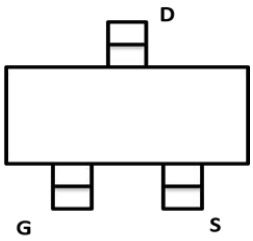
General description
N-Channel MOSFET

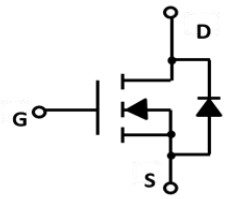
FEATURES
- V_{DS}=20V
- I_D=4.5A
- $R_{DS(ON)}$(at V_{GS}=4.5V)＜35 mΩ
- $R_{DS(ON)}$(at V_{GS}=2.5V)＜45 mΩ
- Trench Power MOSFET technology
- High Power and current handing capability
- High density cell design for low $R_{DS(ON)}$

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	℃/W
Junction and Storage Temperature	T_J、T_{STG}	-50~+150	℃

Electrical Characteristics

Parameters	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	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} = ± 10V, V_{DS} = 0V	--	--	±100	nA
Gate threshold voltage (note 3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D = 250μA	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	mΩ
		V_{GS} = 3.3V, I_D = 2A	--	32	40	mΩ
		V_{GS} = 2.5V, I_D = 1A	--	36	45	mΩ
Diode forward voltage (note 3)	V_{SD}	I_S= 2A, V_{GS} = 0V	--	0.74	1.2	V
Dynamic Characteristics (note4)						
Input Capacitance	Ciss	V_{DS}= 10V,V_{GS}=0V, f =1MHz	--	280	--	pF
Output Capacitance	Coss		--	46	--	pF
Reverse Transfer Capacitance	Crss		--	42	--	pF
Switching Characteristics (note 4)						
Turn-on delay time	td(on)	V_{DD}= 10V,I_D= 4A,R_G= 3.3Ω, V_{GS}= 4.5V	--	11	--	ns
Turn-on rise time	tr		--	35	--	ns
Turn-off delay time	td(off)		--	25	--	ns
Turn-off fall time	tf		--	32	--	ns
Total Gate Charge	Q_g	V_{DS}= 10V,I_D=3A, V_{GS}=5V	--	4.7	--	nC
Gate-Source Charge	Qgs		--	0.6	--	nC
Gate-Drain Charge	Qgd		--	1.7	--	nC

Note :

1)Repetitive rating：Pluse width limited by maximum junction temperature

2)Surface Mounted on FR4 board，t≤10 sec.

3)Pulse test : Pulse width≤300μs, duty cycle≤2%.

4)Guaranteed by design, not subject to production.

Typical Characteristics

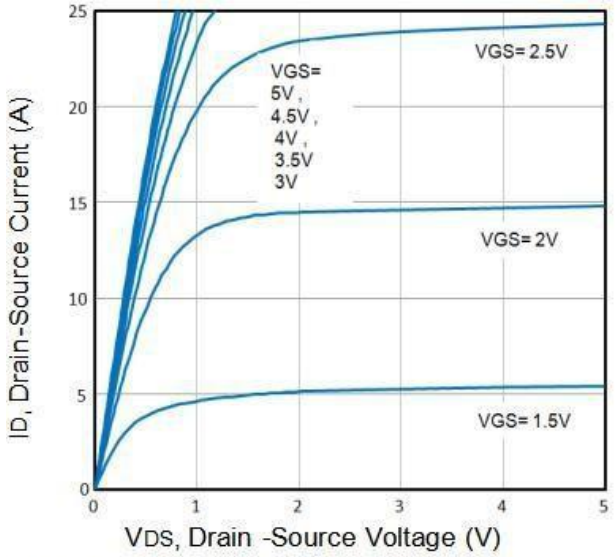


Fig1. Typical Output Characteristics

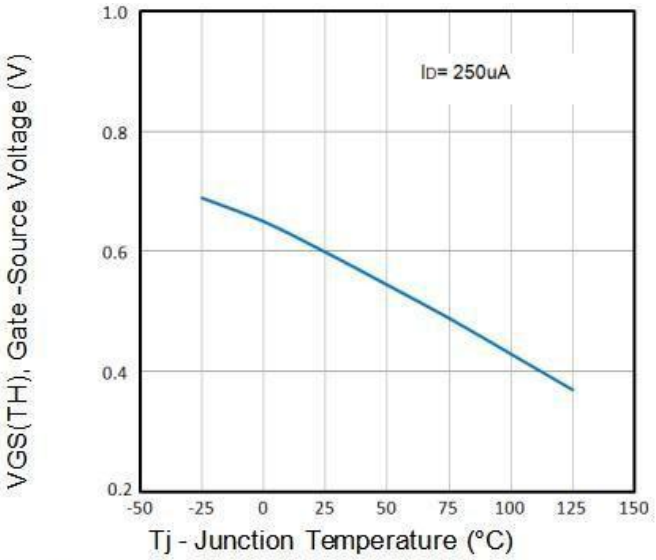


Fig2. Normalized Threshold Voltage Vs. Temperature

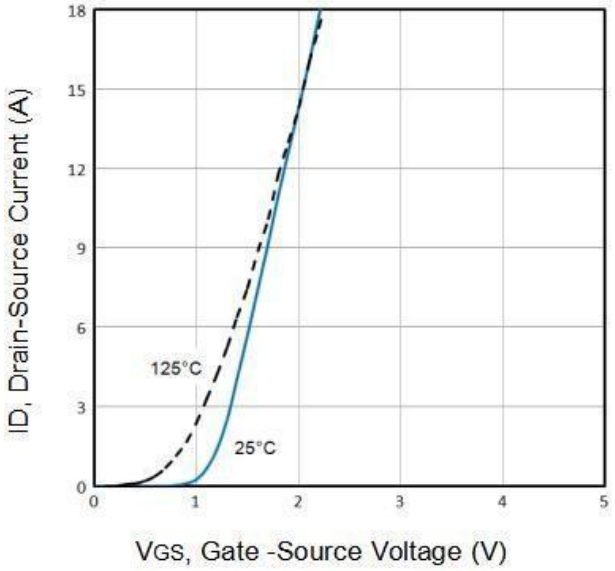


Fig3. Typical Transfer Characteristics

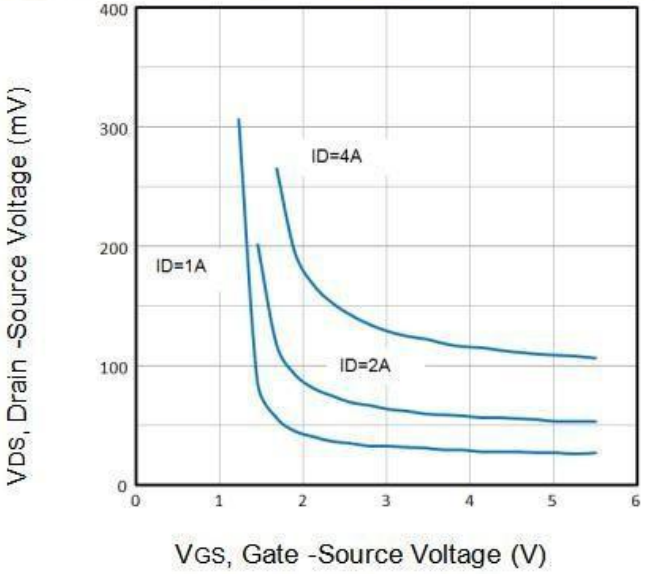


Fig4. Drain -Source Voltage vs Gate -Source Voltage

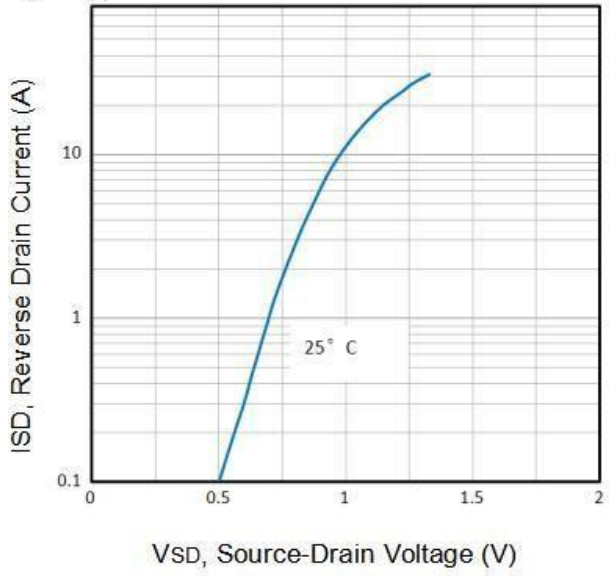


Fig5. Typical Source-Drain Diode Forward Voltage

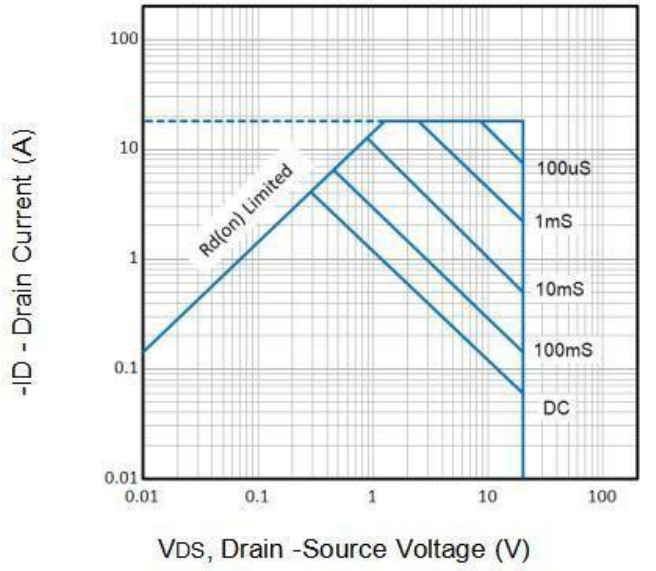


Fig6. Maximum Safe Operating Area

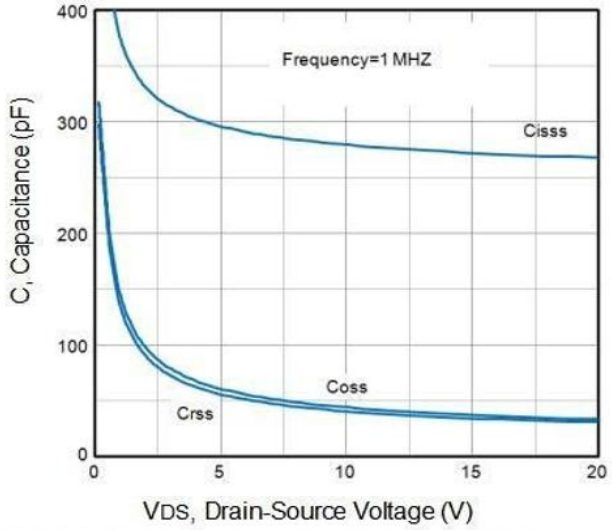


Fig7. Typical Capacitance Vs. Drain-Source Voltage

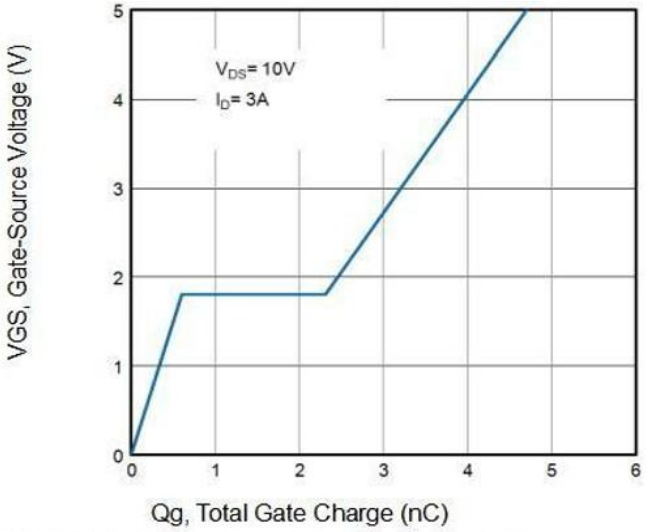
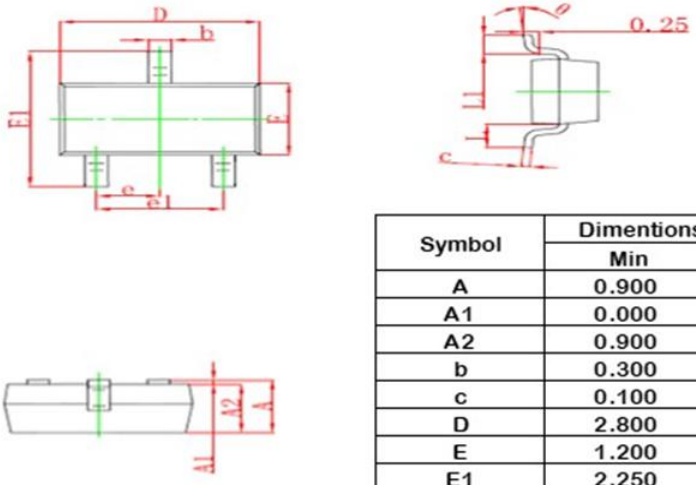


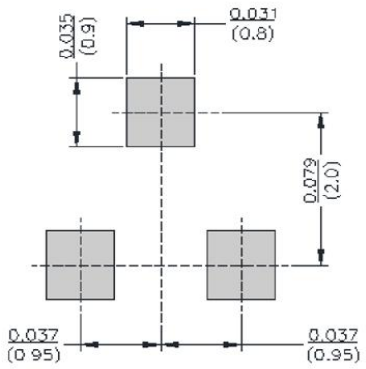
Fig8. Typical Gate Charge Vs. Gate-Source Voltage

SOT-23 Package information



Symbol	Dimentions in Millimeter		Dimentions 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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