N-Ch 120V Fast Switching MOSFETs

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Product Summary

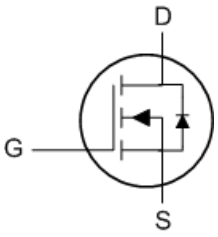
Green

BVDSS	RDSON	ID
120V	118mΩ	3A

Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

SOT23 Pin Configuration



Absolute Maximum Rating (T_A=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	120	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A = 25°C	I_D	3	A
Pulsed Drain Current[1]		I_{DM}	12	A
Power Dissipation	T_A = 25°C	P_D	1.5	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient[2]	$R_{\theta JA}$	83.3	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	120	-	-	V
Gate-body Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120V, V_{GS} = 0V	-	-	1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.4	1.8	2.2	V
Drain-Source On-state Resistance[3]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 1A	-	118	147	mΩ
		V_{GS} = 6V, I_D = 1A	-	-	-	
		V_{GS} = 4.5V, I_D = 1A	-	143	178	
Dynamic Characteristics[4]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	-	210	-	pF
Output Capacitance	C_{oss}		-	36	-	
Reverse Transfer Capacitance	C_{rss}		-	2.7	-	
Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{DS} = 50V, V_{GS} =10V, I_D =3A	-	5	-	nC
Gate-Source Charge	Q_{gs}		-	0.7	-	
Gate-Drain Charge	Q_{gd}		-	1.45	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, V_{GS} =10V, I_D =3A, R_G=3Ω	-	12.8	-	ns
Turn-on Rise Time	t_r		-	19.7	-	
Turn-off Delay Time	$t_{d(off)}$		-	21	-	
Turn- off Fall Time	t_f		-	29	-	
Source-Drain Diode characteristics						
Body Diode Voltage[3]	V_{SD}	I_S = 3A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	I_S		-	-	3	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

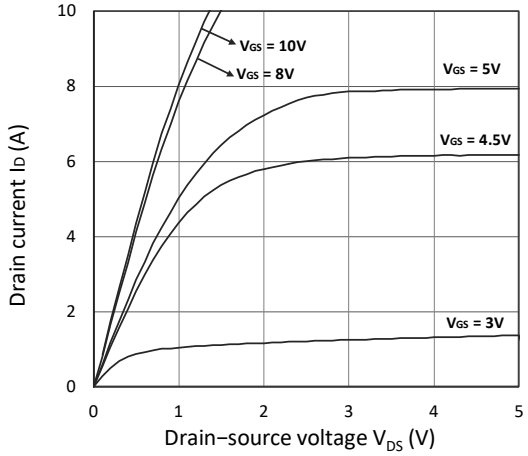


Figure 1. Output Characteristics

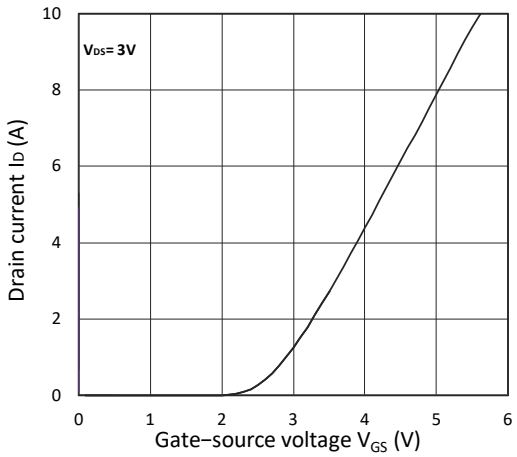


Figure 2. Transfer Characteristics

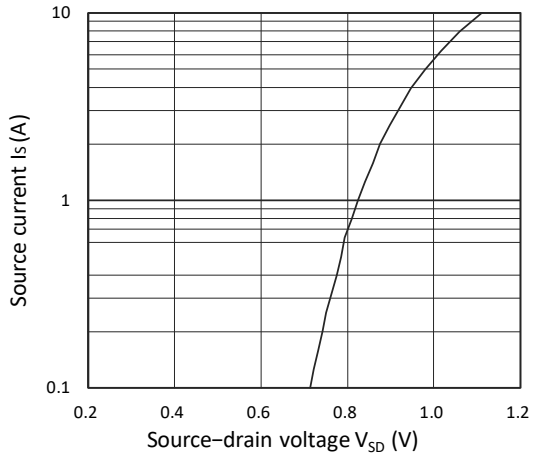


Figure 3. Forward Characteristics of Reverse

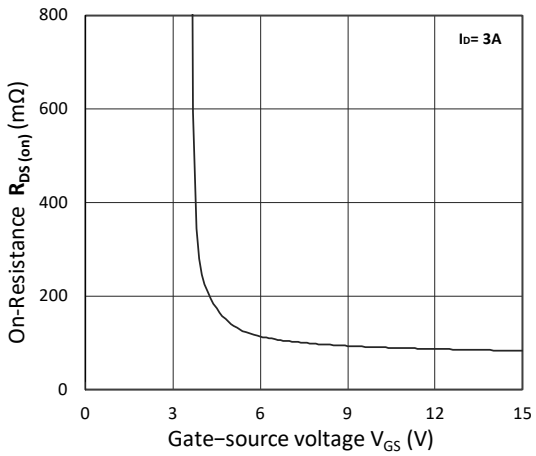


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

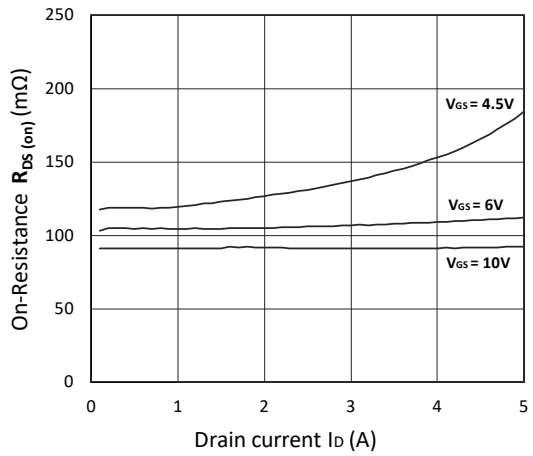


Figure 5. $R_{DS(ON)}$ vs. I_D

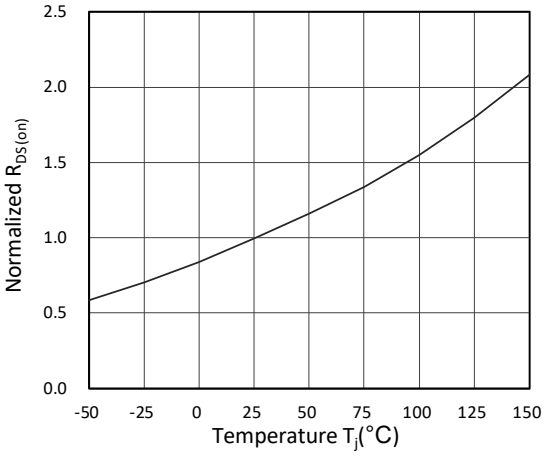


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

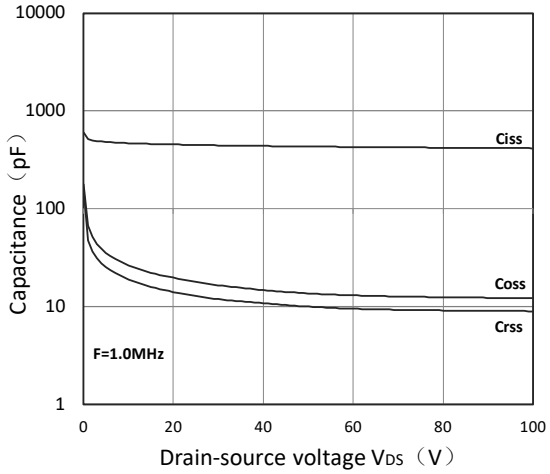


Figure 7. Capacitance Characteristics

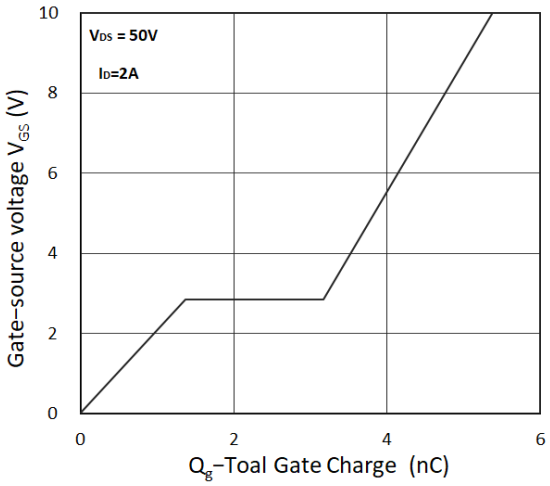
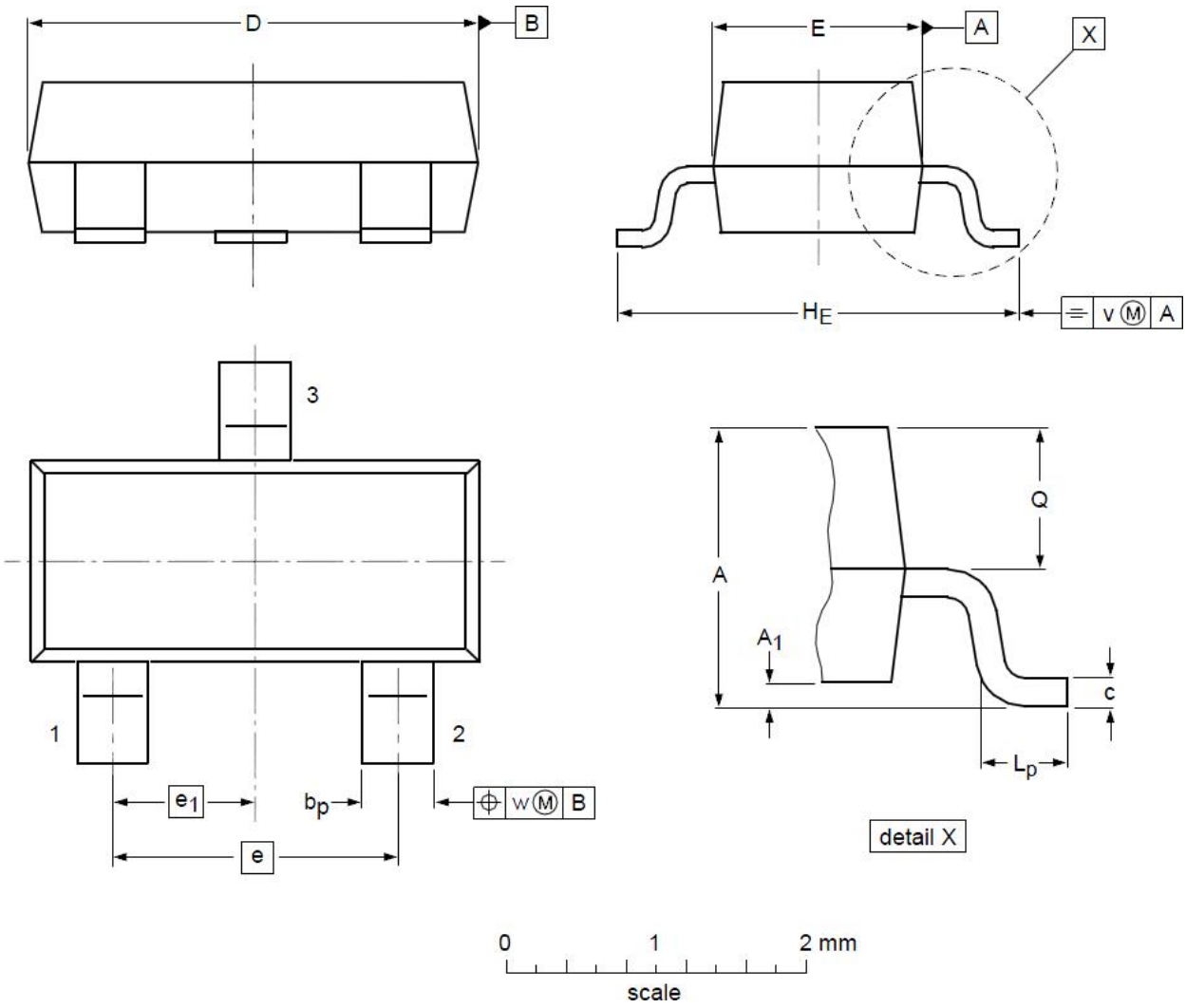


Figure 8. Gate Charge Characteristics

SOT23 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				