

20V/27mΩ@4.5V N-Channel MOSFET

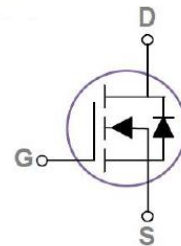
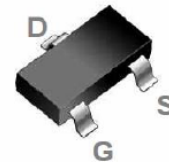
Features

- VDS(max)=20V
- ID(max)=5A
- RDS(ON) =27mΩ(max)@VGS = 4.5V
- RDS(ON) =44mΩ(max)@VGS = 2.5V
- Improved dv/dt capability
- Green Device Available
- Fast switching

Applications

- Notebook
- Hand-Held Instrument
- Load Switch

SOT23 Pin Configuration



Maximum Ratings (Tc = 25°C, Unless Otherwise Noted)

Parameters	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current - Continuous(TC=25°C)	I _D	5	A
Drain Current - Continuous(TC=100°C)		3.2	A
Drain Current - Pulsed	I _{DM} ¹	20	A
Power Dissipation(TC=25°C)	P _D	1.56	W
Power Dissipation - Derate above 25°C		0.012	W/°C
Storage Temperature Range	T _{STG}	-55~ 150	°C
Operating Junction Temperature Range	T _j	-55~ 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Typ.	Unit
Thermal Resistance Junction to ambient	R _{θJA}	---	80	°C/W

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Electrical Characteristics (T_j = 25 °C, Unless Otherwise Noted)

Off Characteristics						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain to Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25 °C , I _D =1mA	---	0.02	---	V/ °C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _J =25 °C	---	---	1	μA
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} = ±12V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =4A	---	21	27	mΩ
		V _{GS} =2.5V, I _D =3A	---	29	44	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.3	0.75	1	V
Dynamic And Switching Characteristics						
Total Gate Charge ^{3, 4}	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =4A	---	6	---	nC
Gate-Source Charge ^{3, 4}	Q _{gs}		---	4	---	
Gate-Drain Charge ^{3, 4}	Q _{gd}		---	1.5	---	
Turn-on Delay Time ^{3, 4}	T _{d(on)}	V _{DD} =10V, I _D =1A V _{GS} =4.5V, R _{GEN} =25Ω	---	4	---	nS
Turn-on Rise Time ^{3, 4}	T _r		---	13	---	
Turn-off Delay Time ^{3, 4}	T _{d(off)}		---	65	---	
Turn-off Fall Time ^{3, 4}	T _f		---	33	---	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1MHz	---	455	---	pF
Output Capacitance	C _{oss}		---	64	---	
Reverse Transfer Capacitance	C _{rss}		---	55	---	
Drain-Source Diode Characteristics And Maximum Ratings						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Continuous Source Current	I _S	V _G =V _D =0V,	---	---	5	A
Pulsed Source Current ³	I _{SM}	Force Current	---	---	16	A
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25 °C	---	---	1.2	V

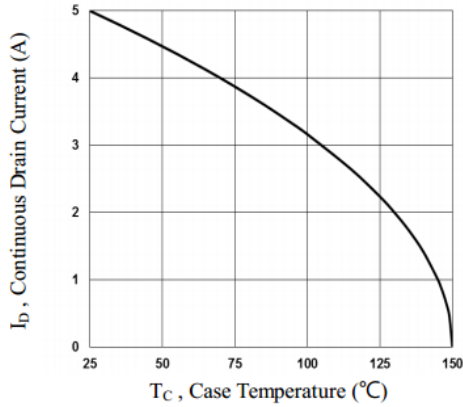


Fig.1 Continuous Drain Current vs. T_c

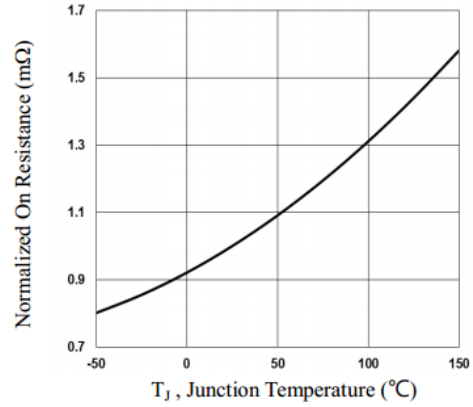


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

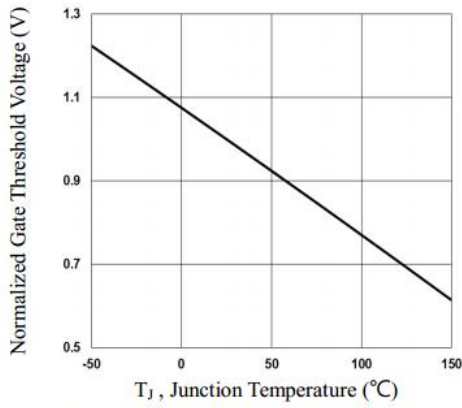


Fig.3 Normalized V_{th} vs. T_j

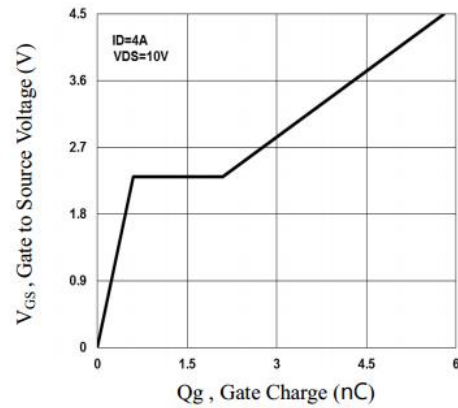


Fig.4 Gate Charge Waveform

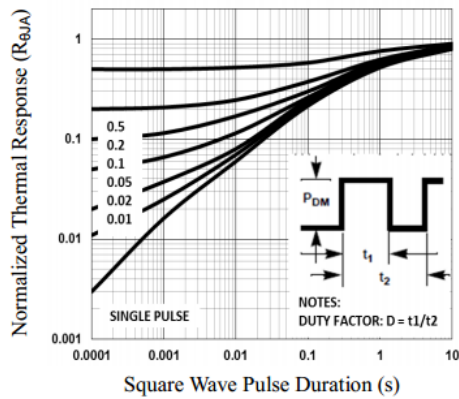


Fig.5 Normalized Transient Impedance

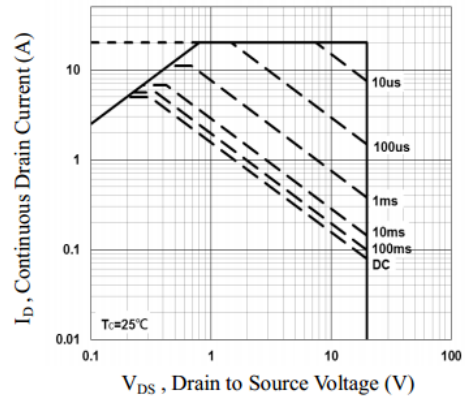


Fig.6 Maximum Safe Operation Area

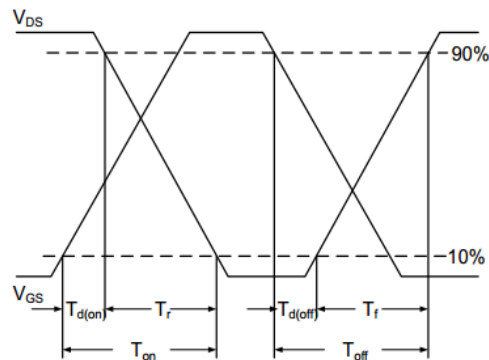


Fig.7 Switching Time Waveform

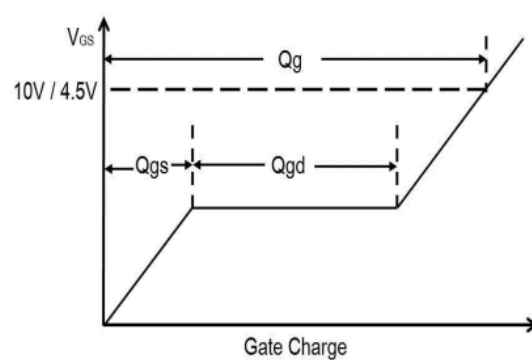
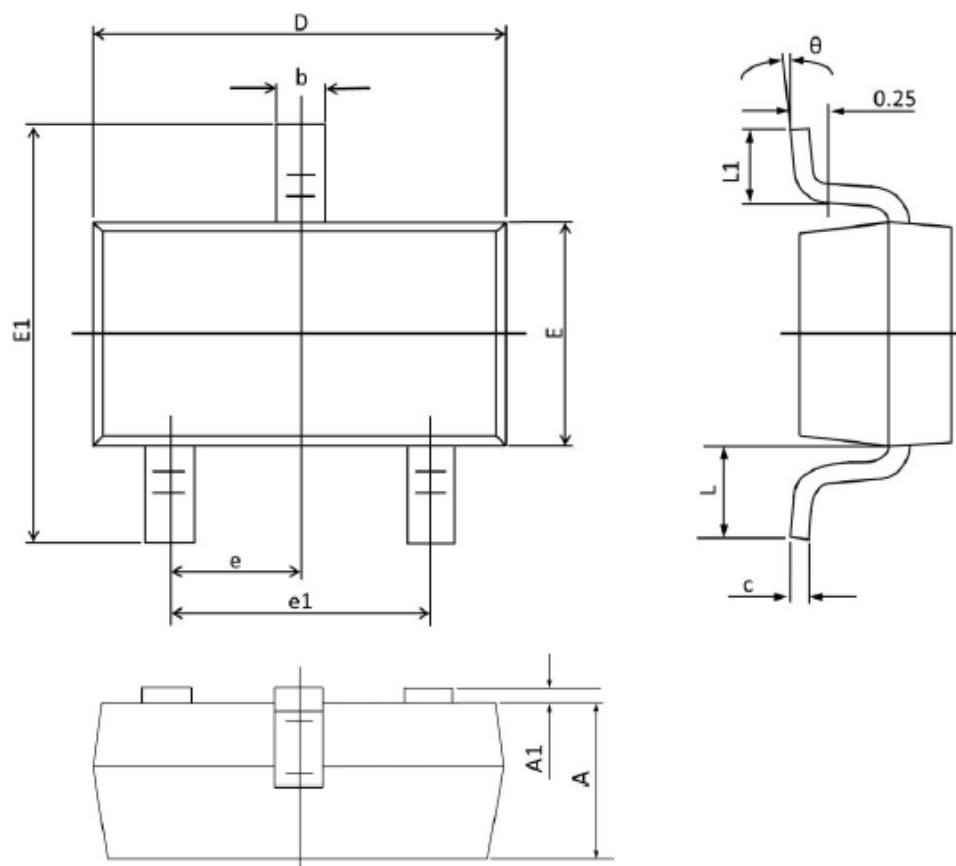


Fig.8 Gate Charge Waveform

SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
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	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°