

20V/55mΩ@4.5V N-Channel MOSFET

Features

- $V_{DS(max)}=20V$
- $I_D(max)=3A$
- $R_{DS(ON)} < 55m\Omega(max)@V_{GS} = 4.5V$
- $R_{DS(ON)} < 85m\Omega(max)@V_{GS} = 2.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

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	3	A
Drain Current - Continuous(TC=100°C)		2	A
Drain Current - Pulsed	I_{DM}^1	12	A
Power Dissipation(TC=25°C)	P_D	1.2	W
Power Dissipation - Derate above 25°C		0.0096	W/°C
Storage Temperature Range	T_{STG}	-55~ 150	°C
Operating Junction Temperature Range	T_J	-55~ 150	°C

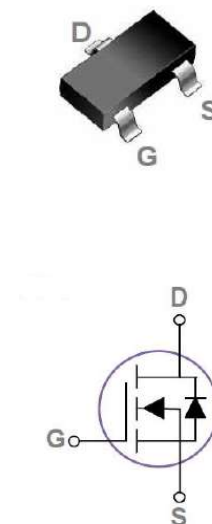
Thermal Characteristics

Parameter	Symbol	Max.	Typ.	Unit
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	103	°C/W

Applications

- Power Manageme
- PWM Application
- Load Switch

SOT23 Pin Configuration



Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
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 Volage	BV _{DSS}	V _{GS} =0V, I _D =250μA	20	---	---	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _J =25℃	---	---	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 =3A	---	45	55	mΩ
		V _{GS} =2.5V, I _D =2A	---	59	85	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.75	1	V
Dynamic And Switching Characteristics						
Total Gate Charge ^{3, 4}	Q _g	V _{DS} =10V, V _{GS} =0--4.5V, I _D =2A	---	3	---	nC
Gate-Source Charge ^{3, 4}	Q _{gs}		---	0.5	---	
Gate-Drain Charge ^{3, 4}	Q _{gd}		---	0.7	---	
Turn-on Delay Time ^{3, 4}	T _{d(on)}	V _{DD} =10V,I _D =2A V _{GS} =4.5V,R _{GEN} =3Ω	---	3	---	nS
Turn-on Rise Time ^{3, 4}	T _r		---	11	---	
Turn-off Delay Time ^{3, 4}	T _{d(off)}		---	20	---	
Turn-off Fall Time ^{3, 4}	T _f		---	8	---	
Input Capacitance	C _{iss}	V _{DS} =10V,V _{GS} =0V, F=1MHz	---	200	---	pF
Output Capacitance	C _{oss}		---	35	---	
Reverse Transfer Capacitance	C _{rss}		---	28	---	
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,	---	---	3	A
Pulsed Source Current ³	I _{SM}	Force Current	---	---	12	A
Diode Forward Voltage ³	V _{SD}	V _{GS} =0V, I _S =3A, T _J =25℃	---	---	1.2	V

Typical Performance Characteristics

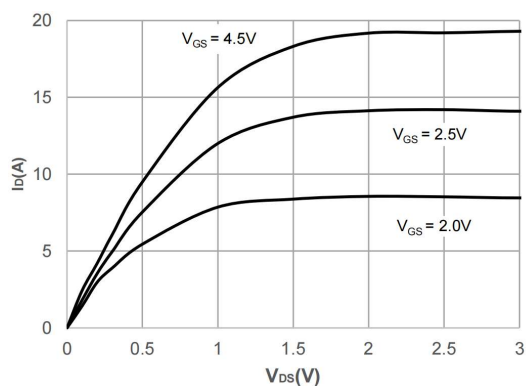


Figure 1: Output Characteristics

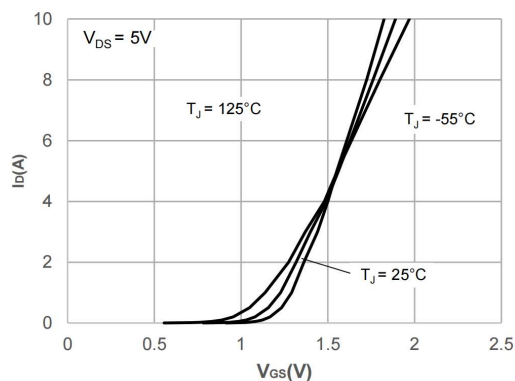


Figure 2: Typical Transfer Characteristics

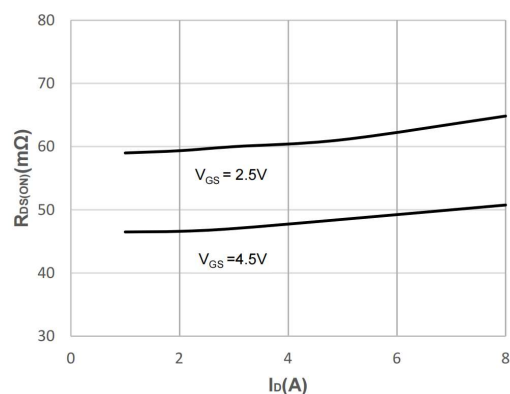


Figure 3: On-resistance vs. Drain Current

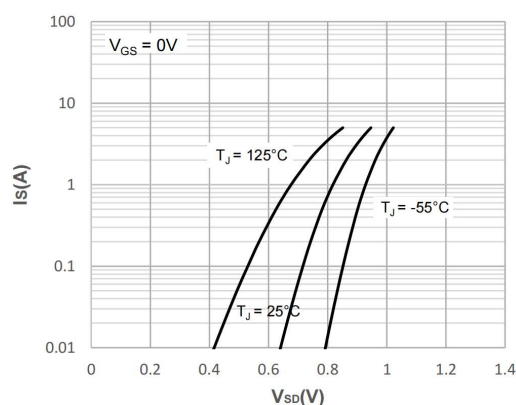


Figure 4: Body Diode Characteristics

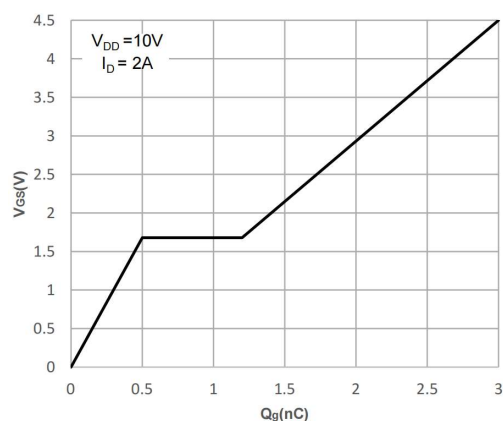


Figure 5: Gate Charge Characteristics

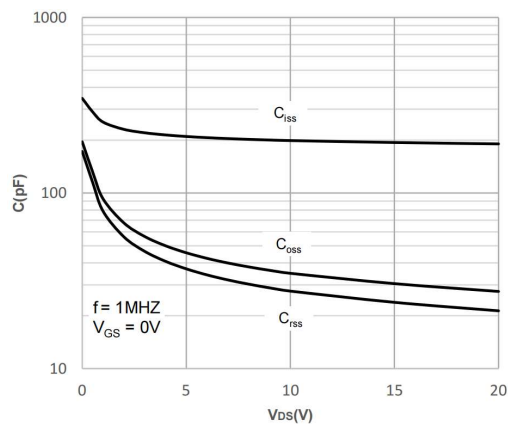


Figure 6: Capacitance Characteristics

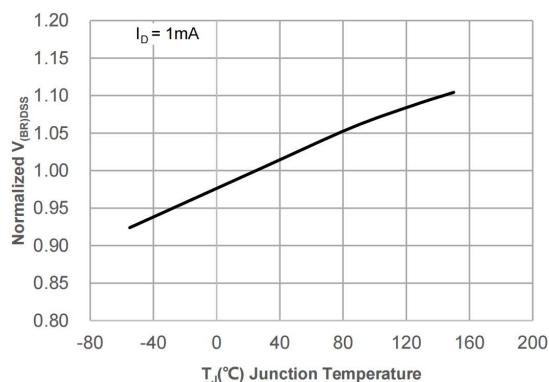


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

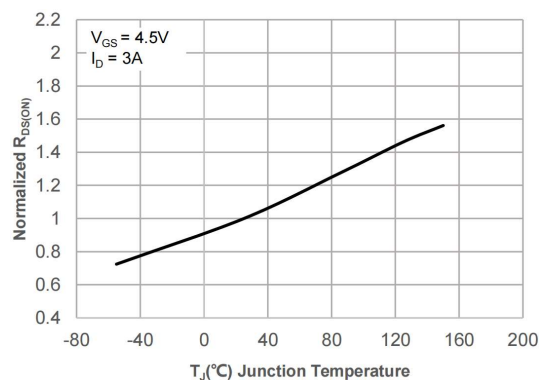


Figure 8: Normalized on Resistance vs. Junction Temperature

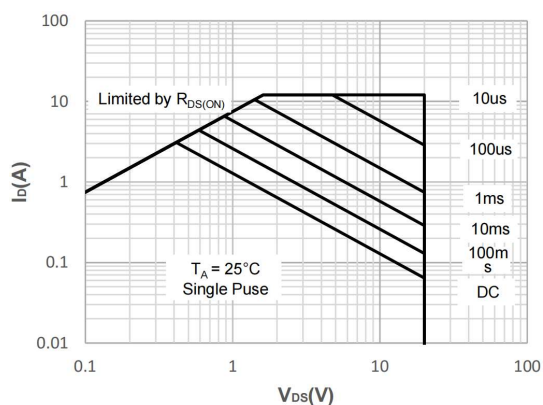


Figure 9: Maximum Safe Operating Area

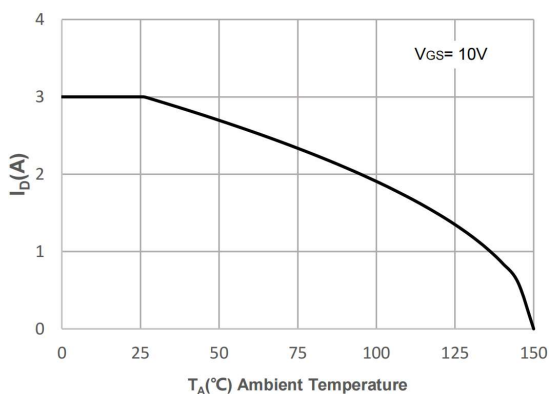


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

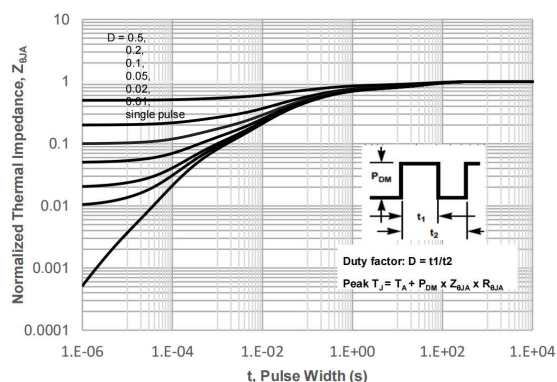


Figure 11: Normalized Maximum Transient Thermal Impedance

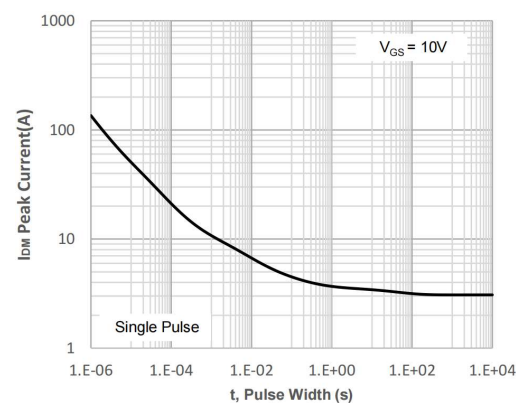
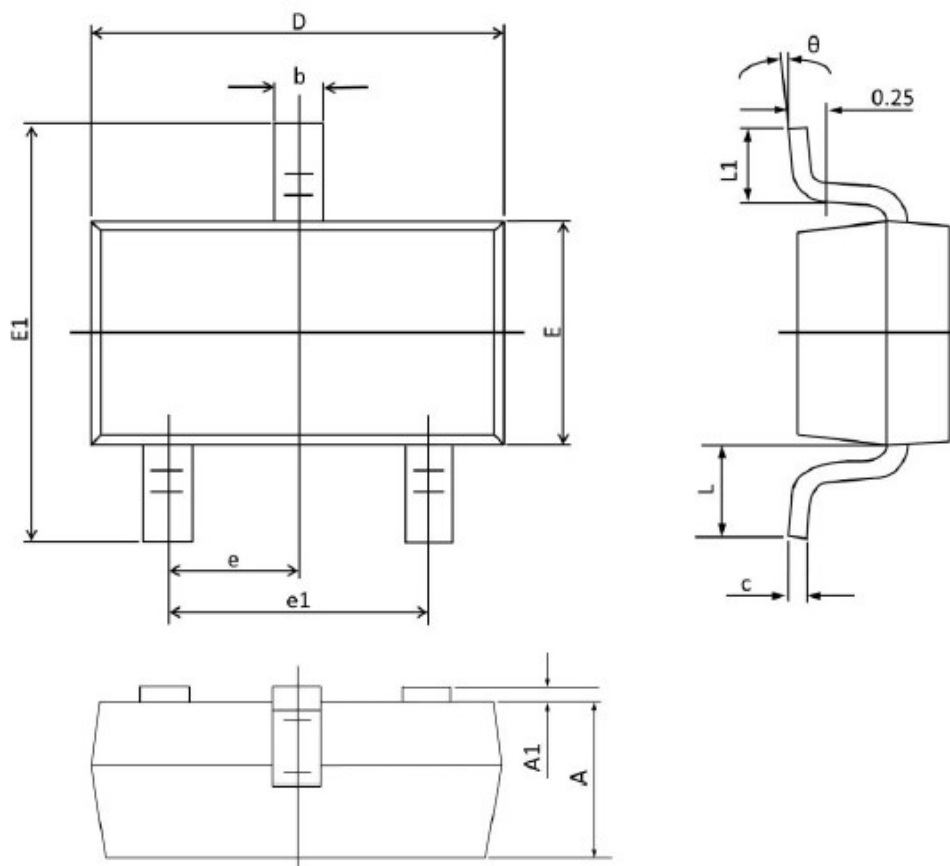


Figure 12: Peak Current Capacity

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°