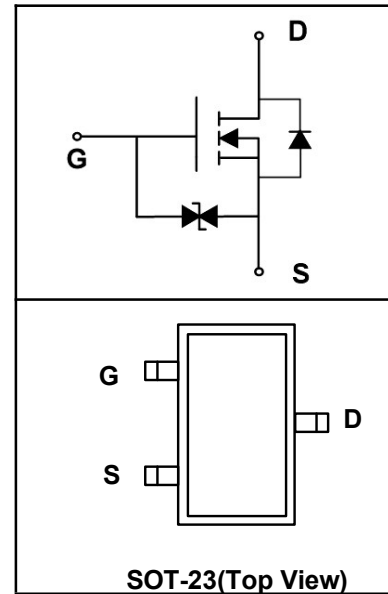


20V N-Channel Enhancement MOSFET

Features

- $V_{DS} = 20V$, $I_D = 7A$
- $R_{DS(on)} < 25m\Omega$ @ $V_{GS} = 4.5V$
- $R_{DS(on)} < 30m\Omega$ @ $V_{GS} = 2.5V$
- Trench LV MOSFET Technology
- SOT-23 Package
- Marking : Making Code
- RoHS Compliant
- ESD Protected
- MSL1



Applications

- Power Management Switches
- DC/DC Converter

Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 10	V
Continuous Drain Current	$T_A = 25^\circ C$	I_D	7	A
Pulsed Drain Current ¹		I_{DM}	28	A
Total Power Dissipation	$T_A = 25^\circ C$	P_D	1.3	W
Single Pulse Avalanche Energy ⁵		E_{AS}	20	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Operating Leadframe and Storage Temperature Range		T_L, T_{STG}	-55 to 150	$^\circ C$
ESD Human Body Model	ESD		2000	V
ESD Charged Device Model			2000	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ²	$R_{\theta JA}$	96	$^\circ C/W$
Max Junction to Lead	$R_{\theta JL}$	67	$^\circ C/W$

Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	20	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	± 10	μA
Drain Cut-off Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0$	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.75	0.9	V
Drain-Source on-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 6A$	-	14	25	m Ω
		$V_{GS} = 2.5V, I_D = 5A$	-	18	30	
Forward Transconductance ³	g_{fs}	$V_{DS} = 4.5V, I_D = 6A$	-	30	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS} = 10V,$ $V_{GS} = 0V,$ $f = 1MHz$	-	850	-	pF
Output Capacitance	C_{oss}		-	140	-	
Reverse Transfer Capacitance	C_{rss}		-	105	-	
Gate Resistance	R_g	$f = 1MHz$	-	4	-	Ω
Switching Characteristics⁴						
Total Gate Charge	Q_g	$V_{GS} = 4.5V,$ $V_{DS} = 10V,$ $I_D = 6A$	-	11	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	
Gate-Drain Charge	Q_{gd}		-	3.1	-	
Turn-On Time	$t_{d(on)}$	$V_{GS} = 4.5V, V_{DD} = 10V,$ $R_G = 3\Omega, I_D = 6A$	-	5.2	-	ns
Rise Time	t_r		-	14	-	
Turn-Off Time	$t_{d(off)}$		-	23	-	
Fall Time	t_f		-	15	-	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 2A, dI/dt = 100A/\mu s$	-	21	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	1.5	-	nC
Source-Drain Body Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS} = 0V, I_S = 1A$	-	-	1.2	V
Continuous Source Current	I_S		-	-	7	A
Body-Diode Continuous Current, Pulsed	I_{Sm}	PW<100 μs , duty cycle 2% max	-	80	-	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
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 $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. This value is guaranteed by design hence it is not included in the production test.
5. The EAS data shows Max. rating . The test condition is $V_{DD} = 25V, V_{GS} = 10V, L = 0.1mH, I_{AS} = 20A$.

Typical Characteristics

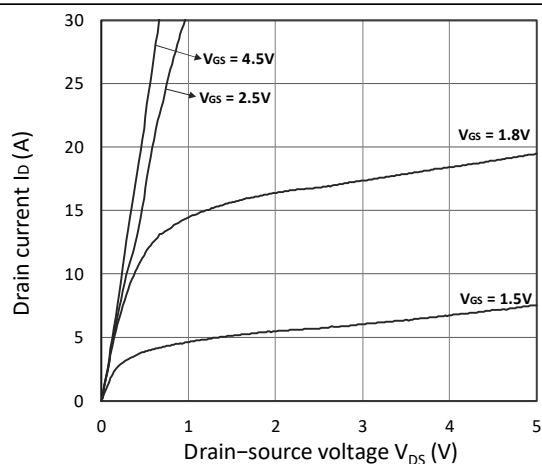


Figure 1. Output Characteristics

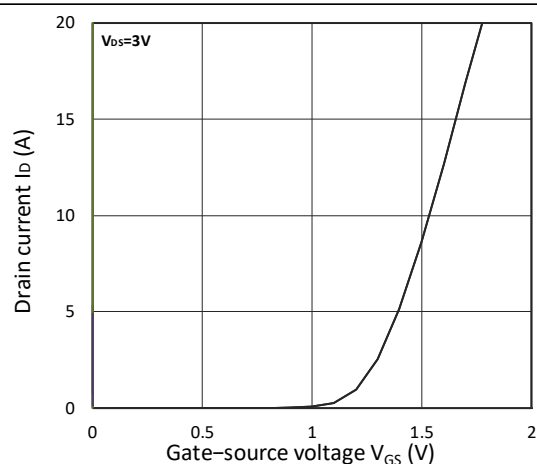


Figure 2. Transfer Characteristics

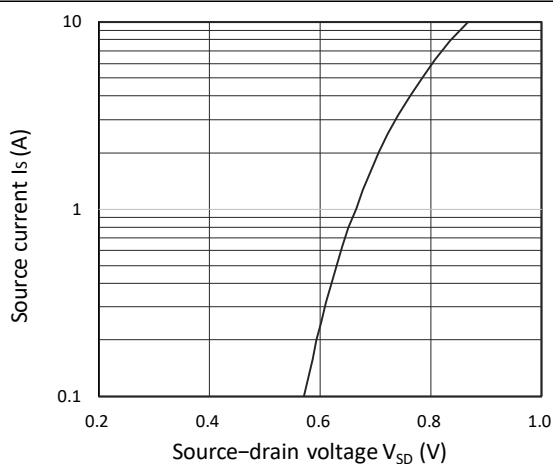
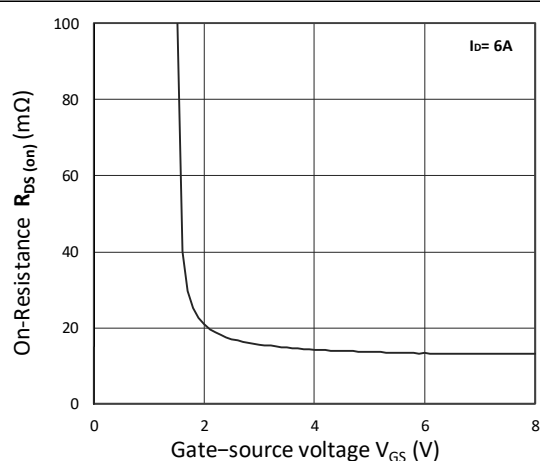
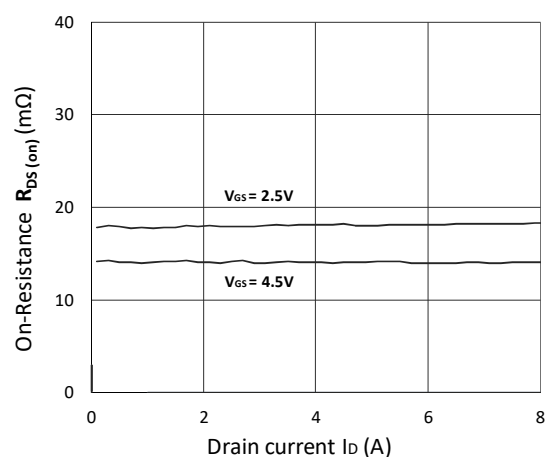
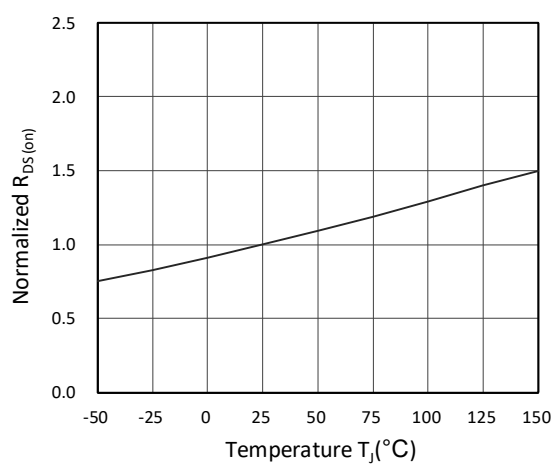


Figure 3. Forward Characteristics of Reverse

Figure 4. $R_{DS(on)}$ vs. V_{GS} Figure 5. $R_{DS(on)}$ vs. I_D Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

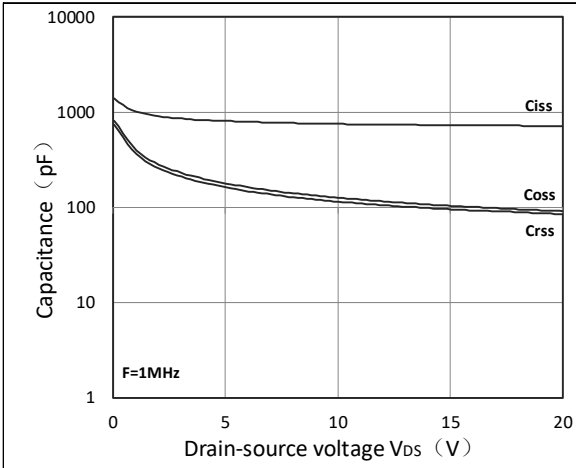


Figure 7. Capacitance Characteristics

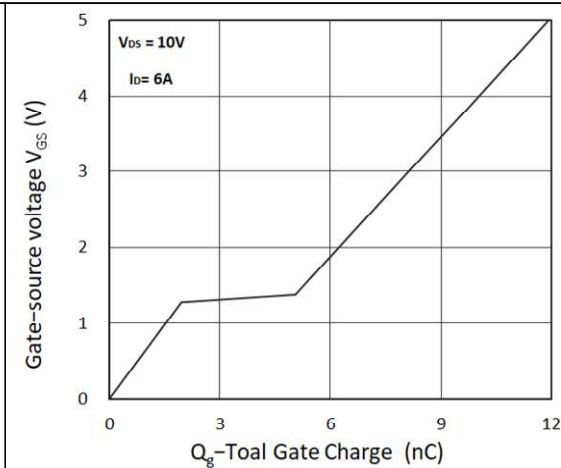
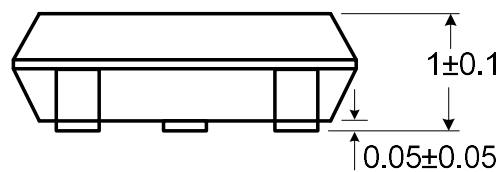
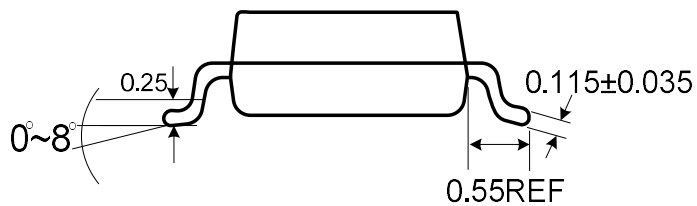
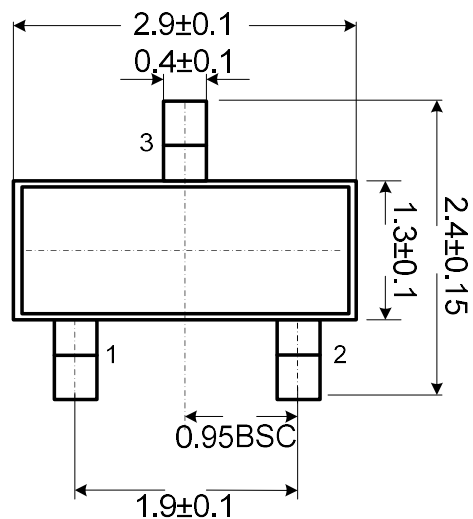


Figure 8. Gate Charge Characteristics

Package Dimension

SOT-23 (Unit: mm)



Revision History and Checking Table

No.	Version	Date	Revision Item	Request	Function & Spec Checking	Package Checking	Typo Checking
1	1.0	2019-04-19	Released Version	Qi Shu Kun	Qi Shu Kun	Liu Jia Ying	Liu Jia Ying
2	1.1	2022-07-15	Add some Items	Customer	Yinp	Zhuji	Zhuji