20V N-Channel Enhancement Mode Field Effect Transistor

Features

V_{DS} 20V, V_{GS} 8V, I_D 2.5A,

$R_{DS(ON)}$ = 75mΩ @V_{GS} = 4.5V.

$R_{DS(ON)}$ = 90mΩ @V_{GS} = 2.5V.

Advanced trench process technology

High-density cell design for ultra low on-resistance

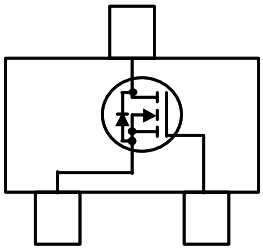
Compact and low profile SOT23 package

General Description

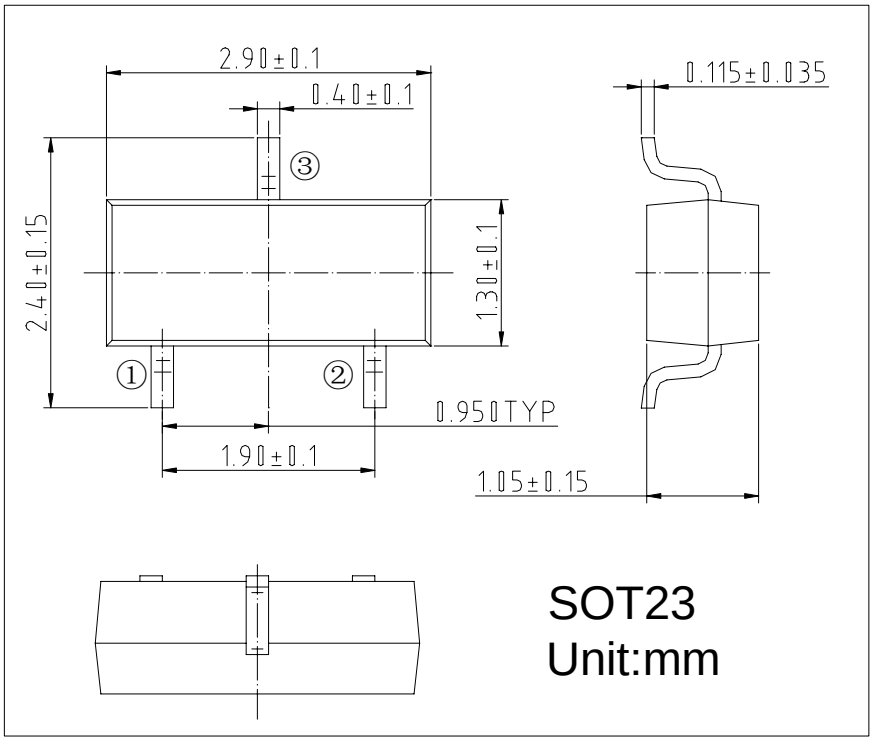
ME2302 is produced with high cell density DMOS trench technology, which is especially used to minimize on-state resistance. This device particularly suits low voltage applications such as portable equipment, power management and other battery powered circuits, and low in-line power dissipation are needed in a very small outline surface mount package. Excellent thermal and electrical capabilities.

Pin configurations

See Diagram below



Package Information



- **Absolute Maximum Ratings** @ T_A = 25°C unless otherwise specified

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	±8	V
Drain Current	Continuous	I_D	2.5	A
	Pulsed		10	
Power Dissipation(1)		P_D	350	mW
Operating and Storage Junction Temperature Range		T_J, T_{STG}	-55 to +150	°C

- **Electrical Characteristics** @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10uA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	--	--	1	uA
Gate–Body Leakage	I_{GSS}	V_{GS} = ±8 V, V_{DS} = 0 V	--	--	±100	nA
ON CHARACTERISTICS(2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 50uA	0.4	0.75	2.0	V
Static Drain–Source On-Resistance	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 3.6 A	--	70	85	mΩ
		V_{GS} = 2.5 V, I_D = 3.1 A	--	90	115	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 3.6 A	2	7.7	14	S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1.0 MHz	--	450	--	pF
Output Capacitance	C_{oss}		--	70	--	
Reverse Transfer Capacitance	C_{rss}		--	43	--	
SWITCHING CHARACTERISTICS						
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 5 V, I_D = 3.6A, V_{GS} =4.5 V,R_{GEN}=6Ω	--	--	15	nS
Turn–On Rise Time	t_r		--	--	80	
Turn–Off Delay Tim	$t_{d(off)}$		--	--	60	
Turn–Off Fall Time	t_f		--	--	25	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage(2)	V_{SD}	V_{GS} = 0 V, I_S = 1.1 A	0.6	0.8	1.15	V

Notes :

(1). Surface Mounted on FR4 Board, t < 10 sec.

(2). Pulse Test: Pulse Width < 300μs, Duty Cycle < 2%

- **Typical Performance Characteristics**

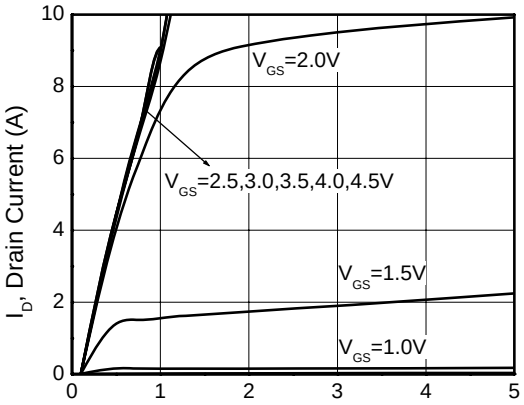


Figure 1. Output Characteristics

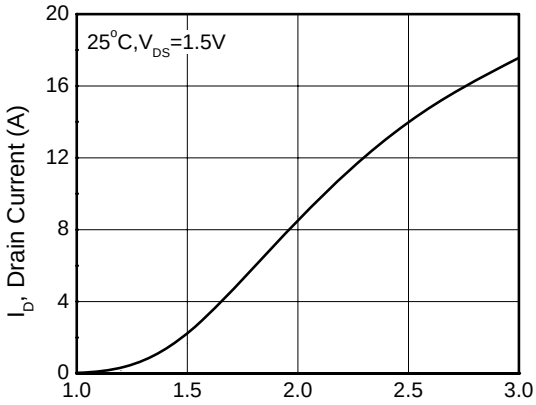


Figure 2. Transfer Characteristics

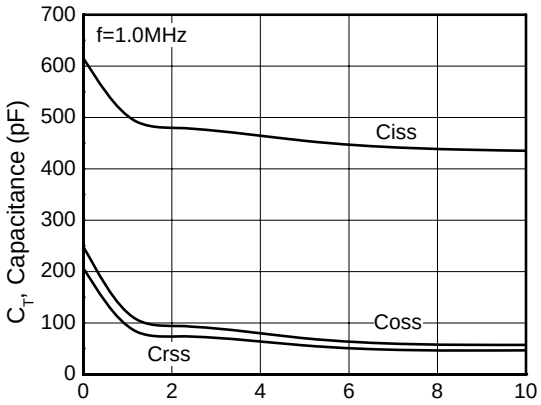


Figure 3. Capacitance

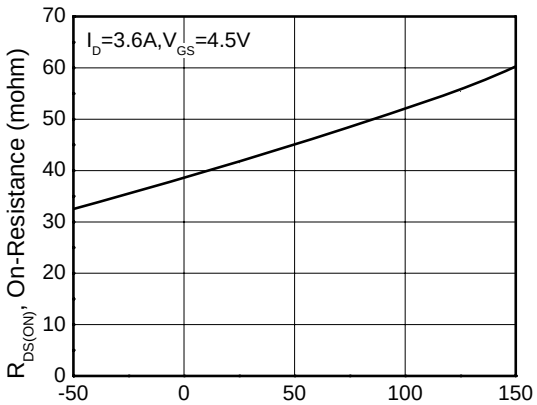


Figure 4. On-Resistance vs. Temperature

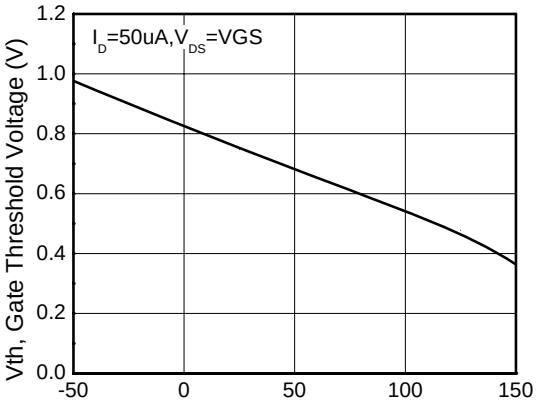


Figure 5. Gate Threshold Vs.Temperature

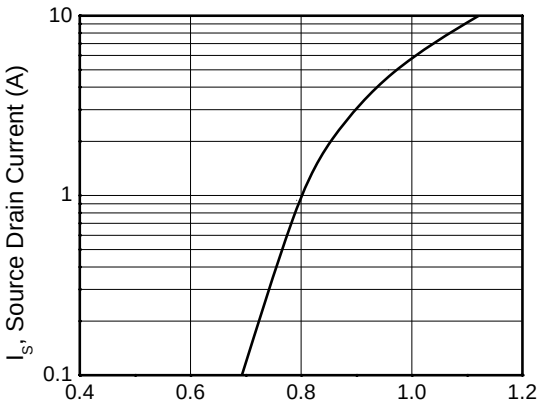


Figure 6. Body Diode Forward Voltage vs. Source Current

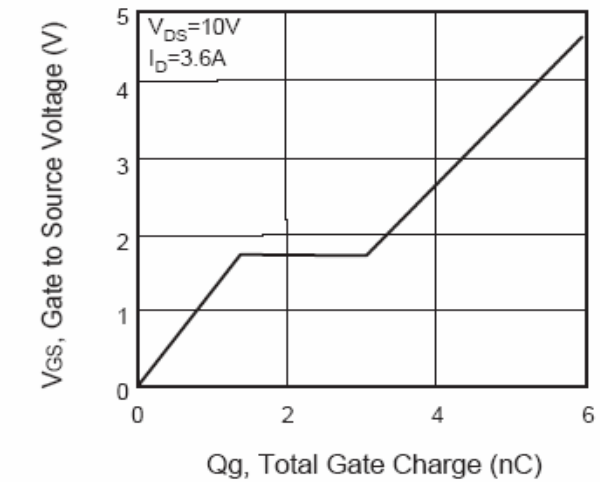


Figure 7. Gate Charge

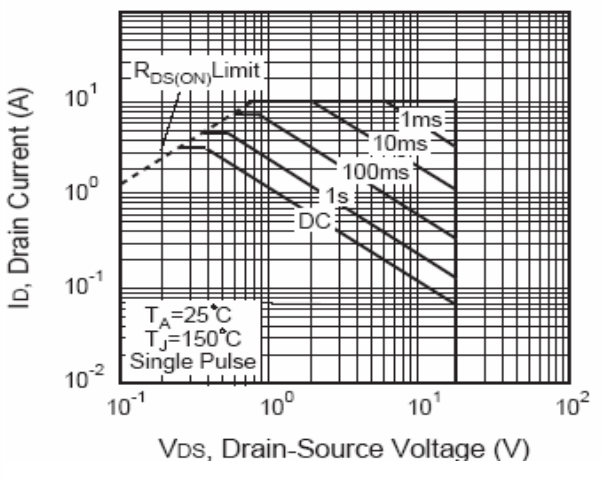


Figure 8. Maximum Safe Operating Area