

P-Channel Enhancement MOSFET

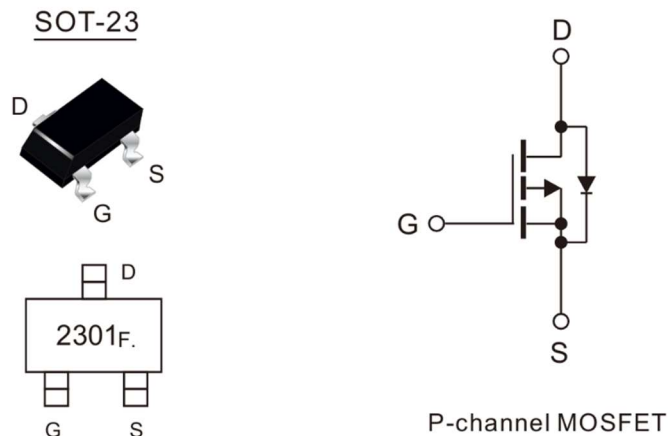
Features

- TrenchFET Power MOSFET
- Halogen-Free & Lead-Free

Product Summary			
V_{DS}	$R_{DS(on)}$ (m Ω) Typ	I_D (A)	Q_g (Typ)
-20V	115 @ -2.5V	-2	3.9nc
	90 @ -4.5V		

Mechanical Data

- Case: SOT-23
- Terminals: Solder plated, solderable per MIL-STD-750, method 2026 guaranteed
- Mounting Position: Any
- Marking: 2301F.
- Tape Reel: 3000pcs



Application

- Load Switch for Portable Devices
- Voltage controlled small signal switch

Absolute Maximum Ratings (at $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	-2	A
Power Dissipation	P_D	0.7	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	178	$^\circ\text{C/W}$

Note:

1) Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Characteristics at T_J = 25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at V _{GS} =0V, I _D =-250μA	BV _{DSS}	-20			V
Drain-Source Leakage Current at V _{DS} =-20V, V _{GS} =0V	I _{DSS}			-1	μA
Gate Leakage Current at V _{GS} =±10V, V _{DS} =0V	I _{GSS}			±0.1	μA
Gate-Source Threshold Voltage at V _{DS} =V _{GS} , I _D =-250μA	V _{GS(th)}	-0.4	-0.62	-1.0	V
Drain-Source On-State Resistance at V _{GS} = -4.5V, I _D = -1.5A at V _{GS} = -2.5V, I _D = -1.5A	R _{DS(on)}		90 115	120 150	mΩ
DYNAMIC PARAMETERS					
Input Capacitance at V _{GS} =0V, V _{DS} =-10V, f=1MHz	C _{iss}		290		pF
Output Capacitance at V _{GS} =0V, V _{DS} =-10V, f=1MHz	C _{oss}		47		
Reverse Transfer Capacitance at V _{GS} =0V, V _{DS} =-10V, f=1MHz	C _{rss}		29		
Gate charge total at V _{DS} =-10V, V _{GS} =-2.5V, I _D =-2A	Q _g		3.9		nC
Gate to Source Charge at V _{DS} =-10V, V _{GS} =-2.5V, I _D =-2A	Q _{gs}		0.7		
Gate to Drain Charge at V _{DS} =-10V, V _{GS} =-2.5V, I _D =-2A	Q _{gd}		0.9		
Turn-On Delay Time at V _{DD} =-10V, V _{GS} =-4.5V, R _{GEN} =2.5Ω, I _D =-1A	t _{d(on)}		12		ns
Turn-On Rise Time at V _{DD} =-10V, V _{GS} =-4.5V, R _{GEN} =2.5Ω, I _D =-1A	t _r		54		
Turn-Off Delay Time at V _{DD} =-10V, V _{GS} =-4.5V, R _{GEN} =2.5Ω, I _D =-1A	t _{d(off)}		15		
Turn-Off Fall Time at V _{DD} =-10V, V _{GS} =-4.5V, R _{GEN} =2.5Ω, I _D =-1A	t _f		9		
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I _S =-2A, V _{GS} =0V	V _{SD}		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I _S			-2	A

Electrical Characteristics Curves

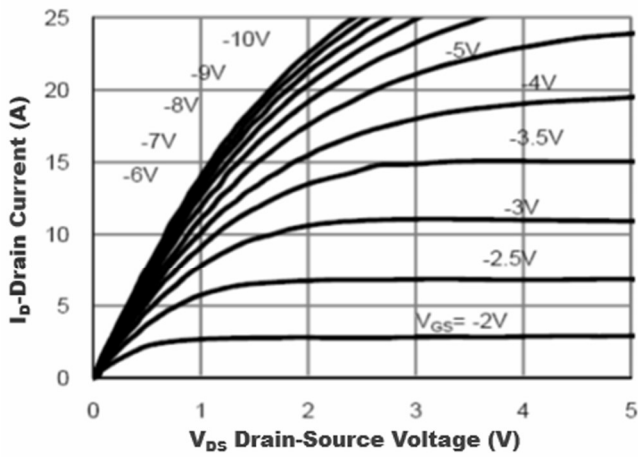


Figure1. Output Characteristics

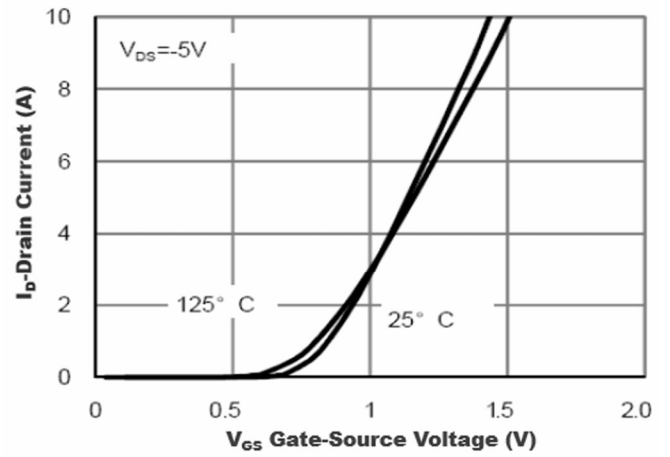


Figure2. Transfer Characteristics

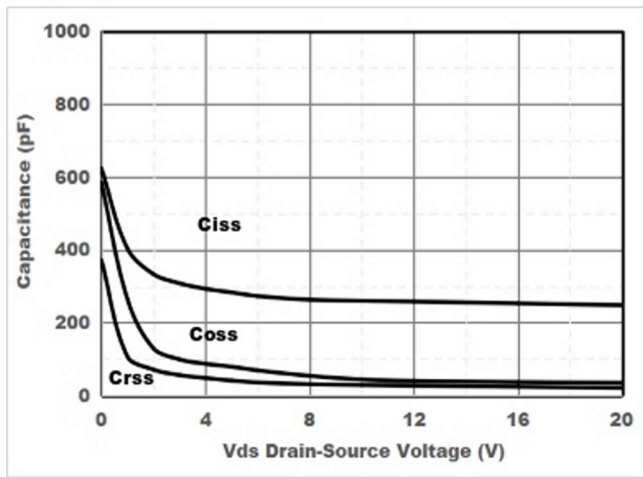


Figure3. Capacitance Characteristics

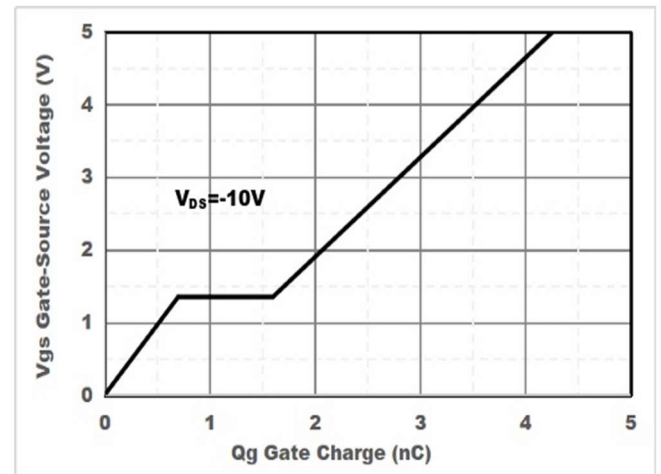


Figure4. Gate Charge

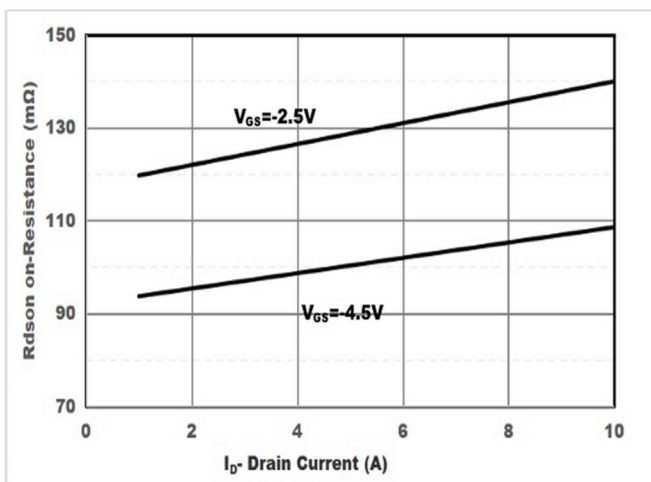


Figure5. Drain -Source on Resistance

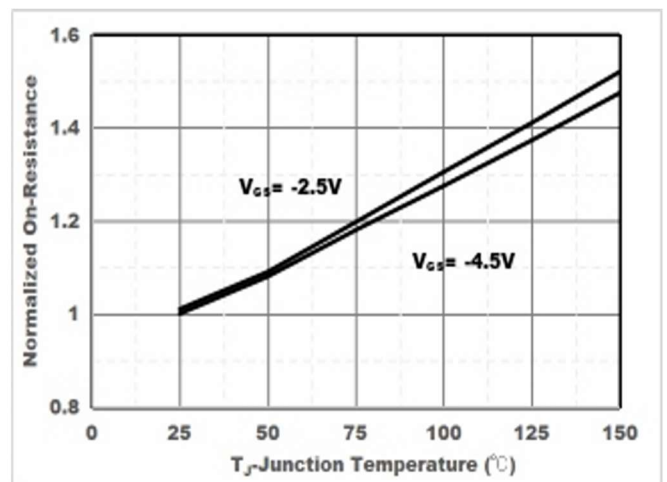


Figure6. Drain -Source on Resistance

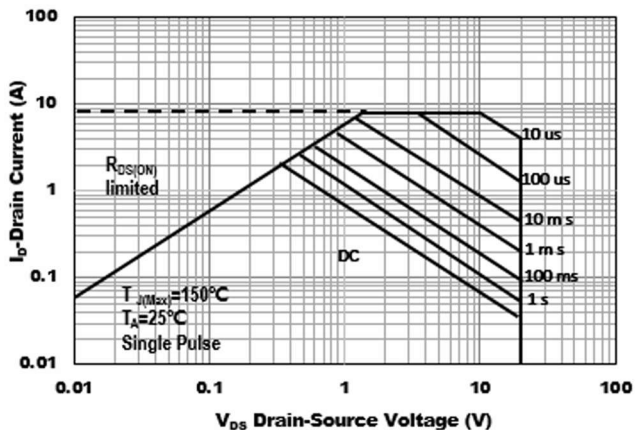


Figure7. Safe Operation Area

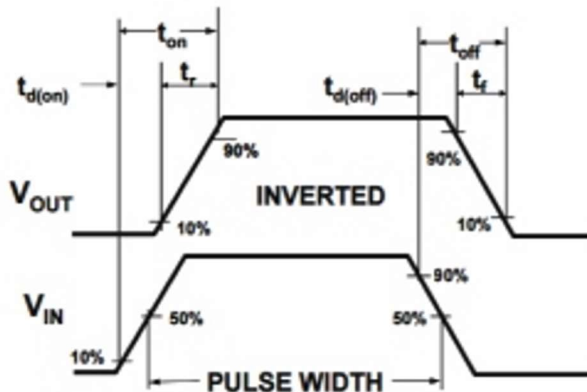
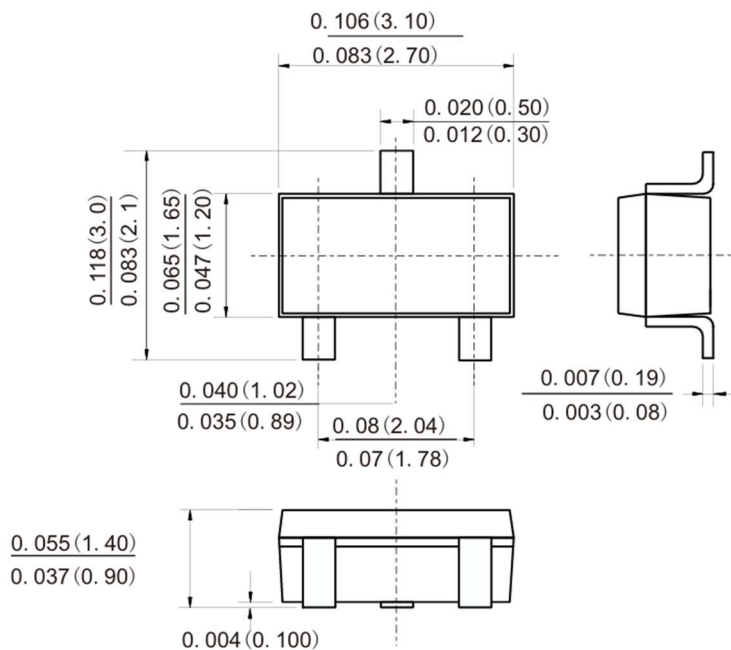


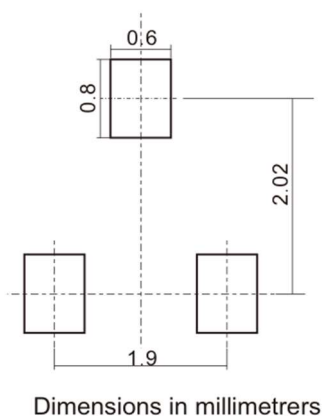
Figure8. Switching wave

Package Outline Dimensions (Units: mm) SOT-23



Dimensions in inches and (millimeters)

Suggested Pad Layout



Dimensions in millimeters