

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} 50V
- I_D 340mA
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <2.5ohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <3.0ohm

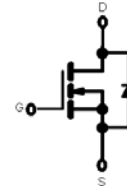
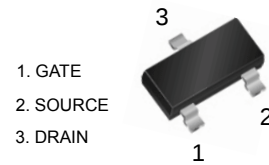
General Description

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage

Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

SOT-23



Equivalent Circuit

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

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	50	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^{\circ}C$ @ Steady State	I_D	340	mA
	$T_A=70^{\circ}C$ @ Steady State		272	
Pulsed Drain Current ^A		I_{DM}	1.5	A
Total Power Dissipation @ $T_A=25^{\circ}C$		P_D	350	mW
Thermal Resistance Junction-to-Ambient @ Steady State ^B		$R_{\theta JA}$	357	$^{\circ}C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^{\circ}C$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	50			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =50V,V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS1}	V _{GS} = ± 20V, V _{DS} =0V			± 100	nA
	I _{GSS2}	V _{GS} = ± 10V, V _{DS} =0V			± 50	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.8	1.2	1.6	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =-300mA		1.1	2.5	Ω
		V _{GS} = 4.5V, I _D =200mA		1.2	3.0	
Diode Forward Voltage	V _{SD}	I _S =300mA,V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				340	mA
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V,f=1MHZ		17.5		pF
Output Capacitance	C _{oss}			11.5		
Reverse Transfer Capacitance	C _{rss}			6.5		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V,V _{DS} =25V,I _D =0.3A		1.7	2.4	nC
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V,V _{DD} =25V, I _D =300mA, R _{GEN} =6Ω		5		ns
Turn-off Delay Time	t _{D(off)}			17		
Reverse recovery Time	t _{rr}	V _{GS} =0V,I _S =300mA,V _R =25V, dI _S /dt=-100A/μs		30		ns

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

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

■ Typical Performance Characteristics

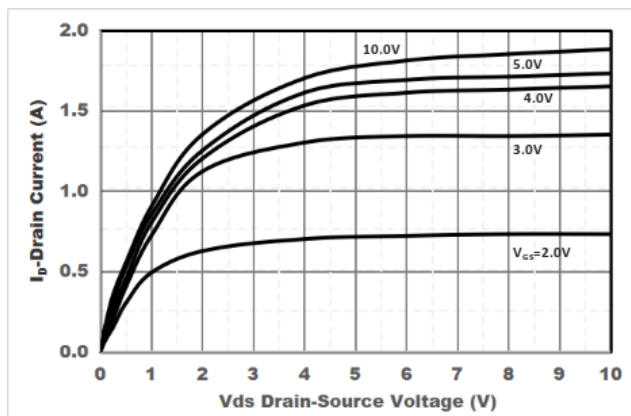


Figure1. Output Characteristics

Figure2. Transfer Characteristics

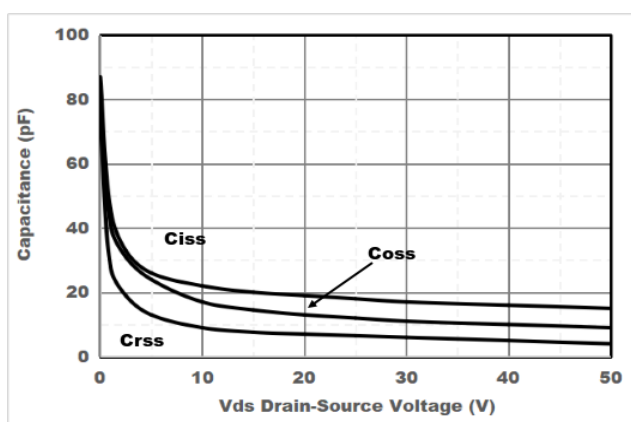


Figure3. Capacitance Characteristics

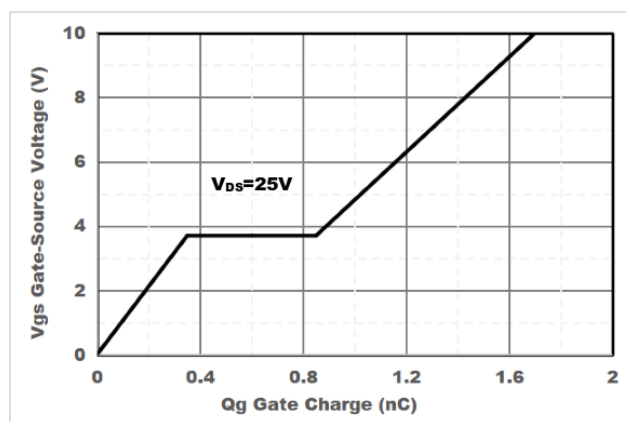


Figure4. Gate Charge

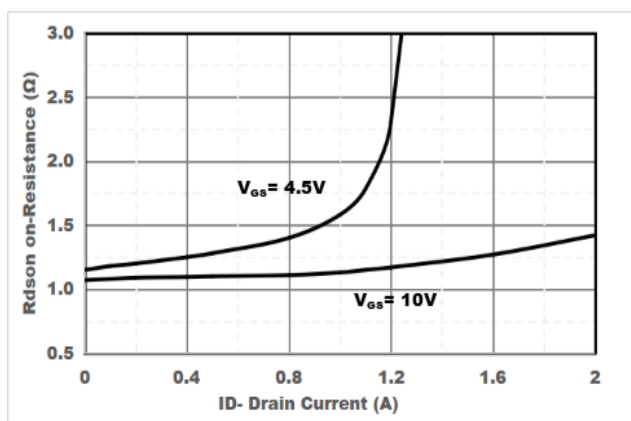


Figure5. Drain-Source on Resistance

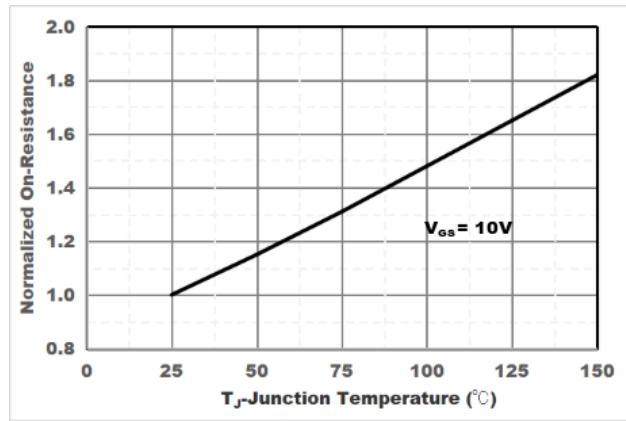


Figure6. Drain-Source on Resistance

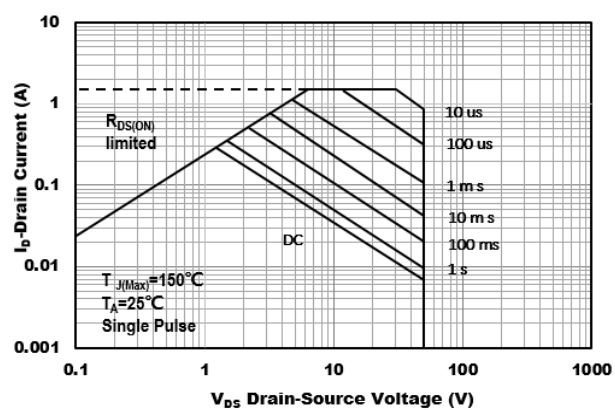


Figure7. Safe Operation Area

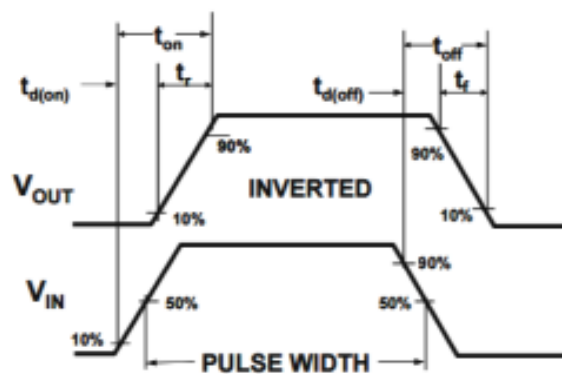
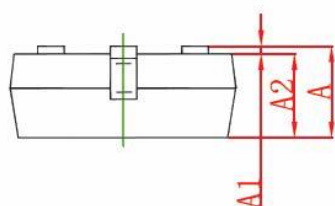
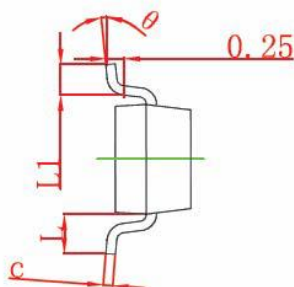
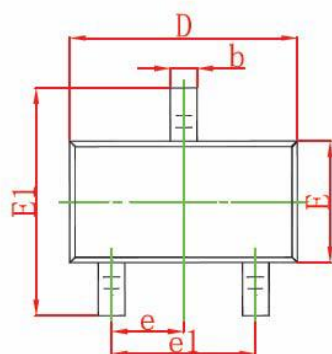


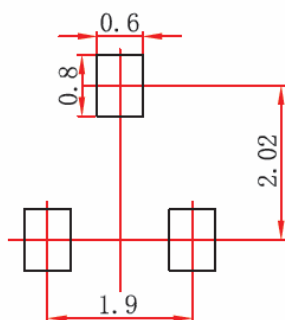
Figure8. Switching wave

■ SOT-23 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
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	0°	8°	0°	8°

■ SOT-23 Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.