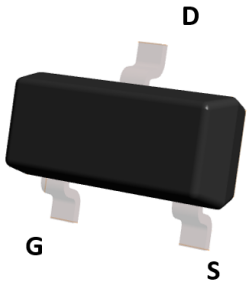
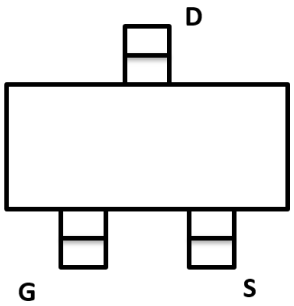
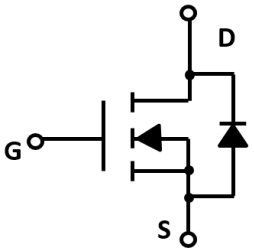
2N7002T

N-Channel Enhancement Mode Field Effect Transistor



Top View





SOT-523

Product Summary

- V_{DS} 60V
- I_D 300mA
- $R_{DS(ON)}$(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

■ **Absolute Maximum Ratings** (T_A=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	60	V
Gate-source Voltage	V_{GS}	±20	V
Drain Current	I_D	300	mA
Pulsed Drain Current [A]	I_{DM}	1.5	A
Total Power Dissipation @ T_A=25℃	P_D	350	mW
Thermal Resistance Junction-to-Ambient @ Steady State [B]	$R_{\theta JA}$	357	℃/ W
Junction and Storage Temperature Range	T_J ,T_{STG}	-55～+150	℃

■ Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.8	1.5	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=300mA		1.2	2.5	Ω
		V_{GS}= 4.5V, I_D=150mA		1.5	3.0	
Diode Forward Voltage	V_{SD}	I_S=300mA,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				300	mA
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=60V,V_{GS}=0V,f=1MHZ		18		pF
Output Capacitance	C_{oss}			12		
Reverse Transfer Capacitance	C_{rss}			7		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=60V,I_D=0.3A		1.7	2.4	nC
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=30V, 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≤300us,Duty cycle ≤2%.
B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

■ Typical Performance Characteristics

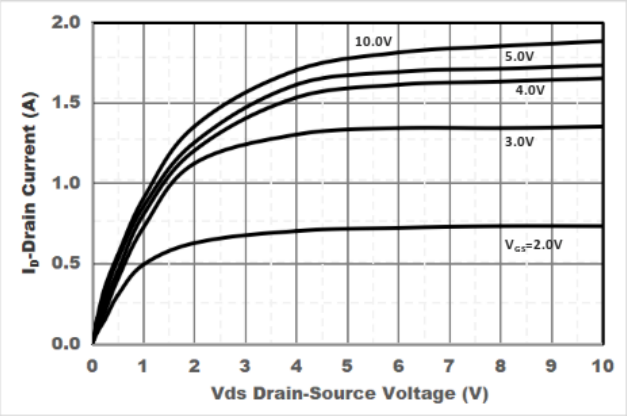


Figure1. Output Characteristics

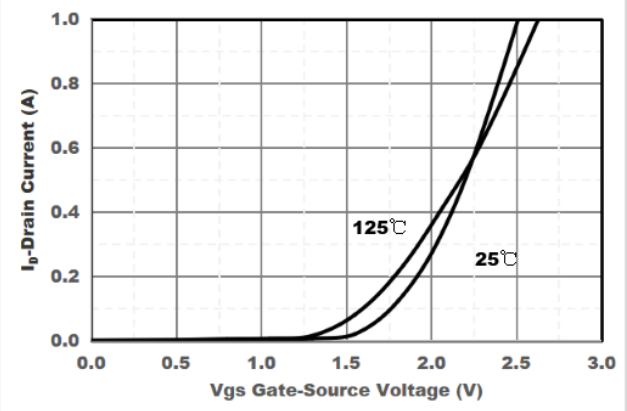


Figure2. Transfer Characteristics

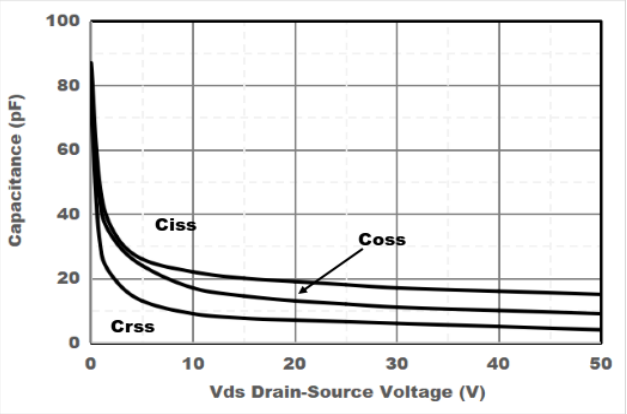


Figure3. Capacitance Characteristics

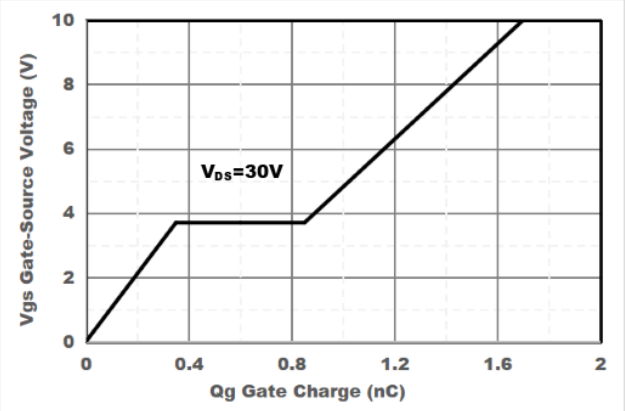


Figure4. Gate Charge

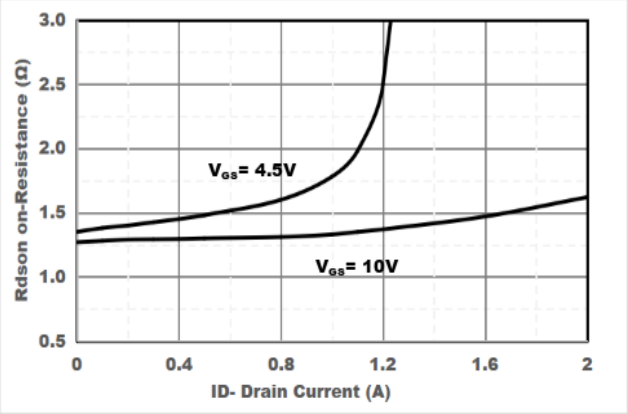


Figure5. Drain-Source on Resistance

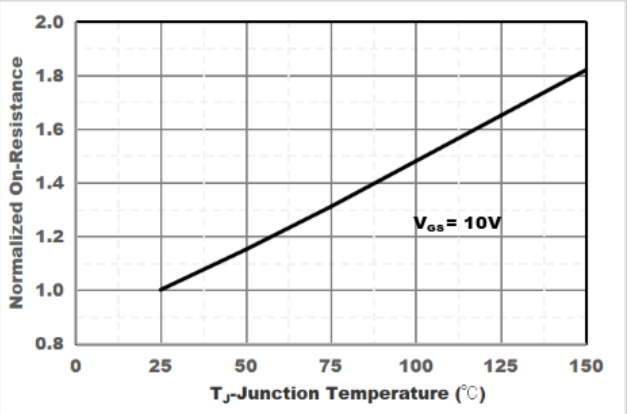


Figure6. Drain-Source on Resistance

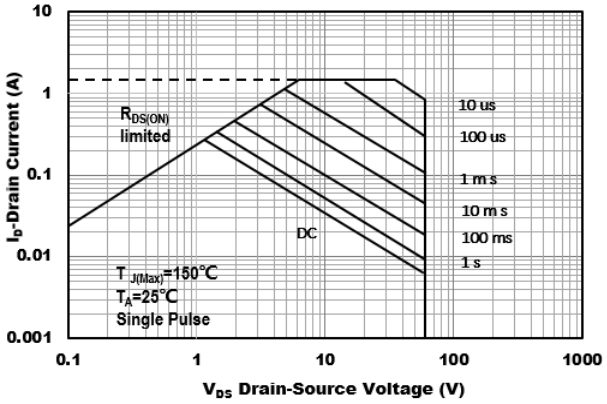


Figure7. Safe Operation Area

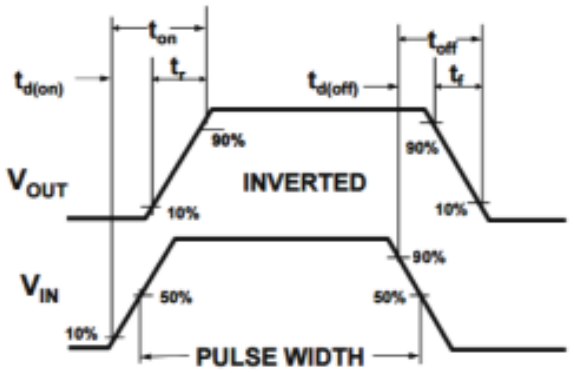
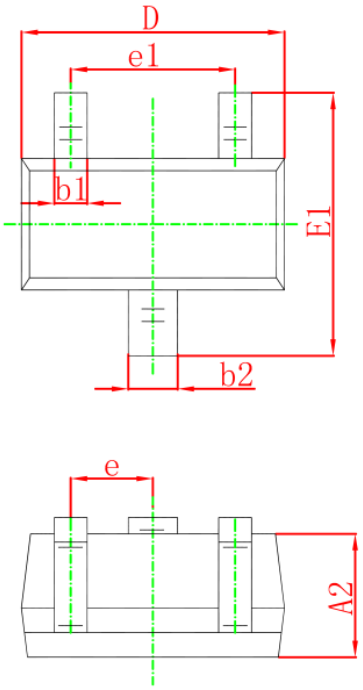


Figure8. Switching wave

■SOT-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°