Advanced Small Signal MOSFET 2N7002MTF

FEATURES

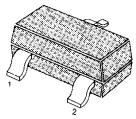
- ❑ Lower $R_{DS(on)}$
- ❑ Improved Inductive Ruggedness
- ❑ Fast Switching Times
- ❑ Lower Input Capacitance
- ❑ Extended Safe Operating Area
- ❑ Improved High Temperature Reliability

BV_{DSS} = 60 V

$R_{DS(on)}$ = 5.0 Ω

I_D = 200 mA

SOT-23



1.Gate 2. Source 3. Drain

Product Summary

Part Number	BV_{DSS}	R_{DS}(on)	I_D
2N7002	60V	5.0Ω	115mA

Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
V_{DSS}	Drain-to-Source Voltage	60	V
I_D	Continuous Drain Current (T_C=25℃)	115	mA
	Continuous Drain Current (T_C=100℃)	73	
I_{DM}	Drain Current-Pulsed ①	800	mA
V_{GS}	Gate-to-Source Voltage	±20	V
P_D	Total Power Dissipation (T_C=25℃)	0.2	W
	Linear Derating Factor	0.16	W/℃
T_J , T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	℃

Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	℃/W

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	60	-	-	V	V_{GS} = 0V, I_D = 250μA
$V_{GS(th)}$	Gate Threshold Voltage	1.0	-	2.5	V	V_{DS} = V_{GS}, I_D = 250μA
I_{GSS}	Gate-Source Leakage, Forward	-	-	100	nA	V_{GS} = 20V
	Gate-Source Leakage, Reverse	-	-	-100		V_{GS} = -20V
I_{DSS}	Drain-to-Source Leakage Current	-	-	1.0	μA	V_{GS} = 40V
		-	-	500		V_{GS} = 40V, T_C = 125℃
$I_{D(ON)}$	On-State Drain-Source Current	0.5	-	-	A	V_{DS} = 10V, V_{GS} = 10V
$R_{DS(on)}$	Static Drain-Source On-State Resistance ②	-	-	5.0	Ω	V_{GS} = 10V, I_D = 0.5A
g_{fs}	Forward Transconductance ②	0.08	-	-	S	V_{DS} = 15V, I_D = 0.2A
C_{iss}	Input Capacitance	-	-	50	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
C_{oss}	Output Capacitance	-	-	25		
C_{rss}	Reverse Transfer Capacitance	-	-	5		
$t_{d(on)}$	Turn-On Delay Time	-	-	20	ns	V_{DD} = 30V, I_D = 0.2A R_G = 25Ω ②③
t_r	Rise Time	-	-	-		
$t_{d(off)}$	Turn-Off Delay Time	-	-	20		
t_f	Fall Time	-	-	-		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	-	-	115	mA	Integral reverse pn-diode In the MOSFET
I_{SD}	Pulse Source Current ①	-	-	800	mA	
V_{SD}	Diode Forward Voltage ②	-	-	1.5	V	T_A = 25 ℃, I_S = 115mA V_{GS} = 0V

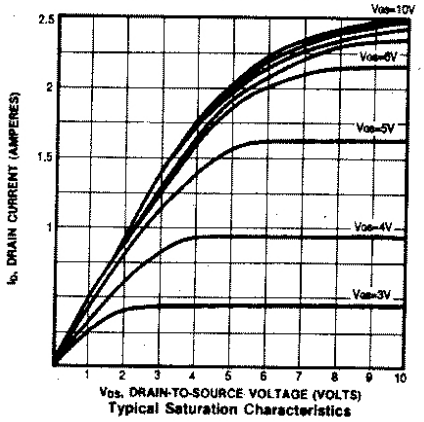
Notes ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② Pulse Test : Pulse Width = 250μs, Duty Cycle ≤ 2%

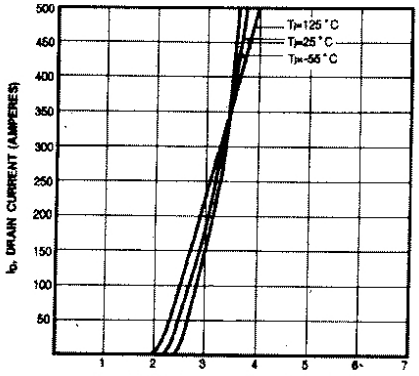
③ Essentially Independent of Operating Temperature

Fig 1. Output Characteristics



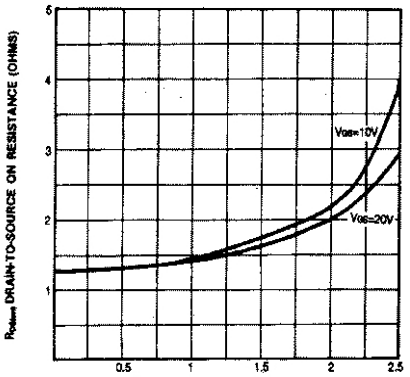
Typical Saturation Characteristics

Fig 2. Transfer Characteristics



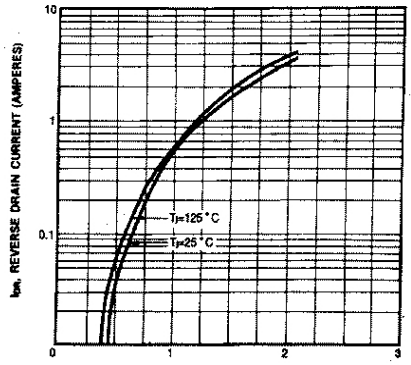
Typical Transfer Characteristics

Fig 3. On-Resistance vs. Drain Current



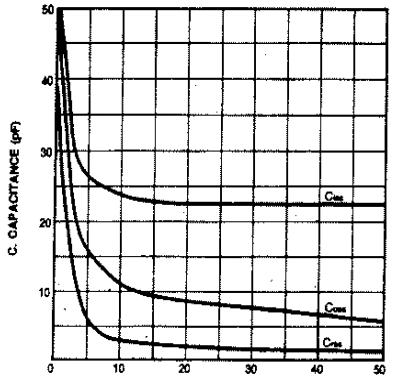
Typical On-Resistance Vs. Drain Current

Fig 4. Source-Drain Diode Forward Voltage



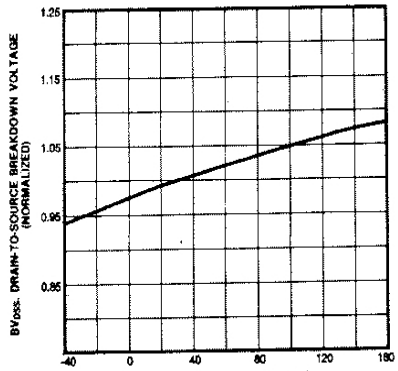
Typical Source—Drain Diode Forward Voltage

Fig 5. Capacitance vs. Drain-Source Voltage



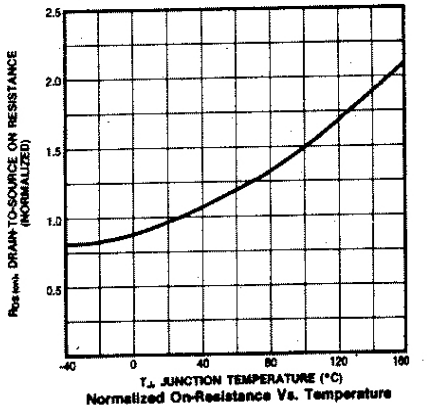
Typical Capacitance Vs. Drain to Source Voltage

Fig 6. Breakdown Voltage vs. Temperature



Breakdown Voltage Vs. Temperature

Fig 7. On-Resistance vs. Temperature



Normalized On-Resistance Vs. Temperature