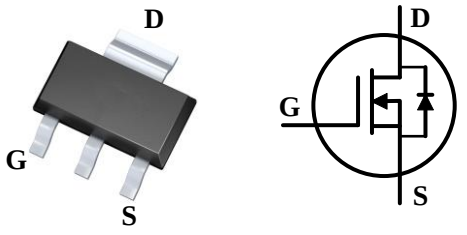
200V N-Channel Depletion-Mode Power MOSFET

General Features

- Depletion Mode (Normally On)
- Fast Switching Speed
- High-input impedance
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(ON)(Max.)}$	$I_{DSS(Min.)}$
200V	3.5Ω	140mA

SOT-223



Applications

- Current Regulator
- Normally-On Switches
- Solid State Relays
- Converters
- Telecommunications
- Power Supply

Ordering Information

Part Number	Package	Marking	Remark
DMS2502	SOT-223	2502	Halogen Free

Absolute Maximum Ratings

T_A=25℃ unless otherwise specified

Symbol	Parameter	DMS2502	Unit
V_{DSX}	Drain-to-Source Voltage [1]	200	V
I_D	Continuous Drain Current	0.5	A
I_{DM}	Pulsed Drain Current [2]	2	
P_D	Power Dissipation	1.5	W
V_{GS}	Gate-to-Source Voltage	±20	V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses beyond those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Note: The MOSFET is sensitive to electrostatic discharge. When handling this device, the worktables, operators, soldering irons and other objects should be protected against anti-static discharge.

Thermal Characteristics

Symbol	Parameter	DMS2502	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83	℃/W

Electrical Characteristics

OFF Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	200	--	--	V	V_{GS}=-5V, I_D=250μA
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	200	nA	V_{DS}=200V, V_{GS}=-5V
I_{GSS}	Gate-to-Source Leakage Current	--	--	100	nA	V_{GS}=20V, V_{DS}=0V
		--	--	-100		V_{GS}=-20V, V_{DS}=0V

ON Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
I_{DSS}	Saturated Drain-to-Source Current	140	--	--	mA	V_{GS}=0V, V_{DS}=10V
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	--	--	3.5	Ω	V_{GS}=0V, I_D=70mA [3]
		--	--	1.8	Ω	V_{GS}=10V, I_D=0.66A [3]
$V_{GS(off)}$	Gate-to-Source Cut-off Voltage	-2.1	--	-1	V	V_{DS}=3V, I_D=400μA
gfs	Forward Transconductance	--	375	--	mS	V_{DS}=10V, I_D=70mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	311	--	pF	V_{GS}=-5V V_{DS}=25V f=1.0MHz
C_{oss}	Output Capacitance	--	28	--		
C_{rss}	Reverse Transfer Capacitance	--	4	--		
Q_g	Total Gate Charge	--	4.62	--	nC	V_{GS}=-5V~5V V_{DS}=100V I_D=500mA
Q_{gs}	Gate-to-Source Charge	--	1.19	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	1.17	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	8.2	--	ns	V_{GS}=-5V~5V V_{DD}=100V I_D=500mA R_G=6Ω
t_r	Rise Time	--	3.4	--		
$t_{d(off)}$	Turn-off Delay Time	--	17.2	--		
t_f	Fall Time	--	26.8	--		

Source-Drain Diode Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_{SD}=0.66A, V_{GS}=-5V

NOTE：

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] Pulse width≤380μs, duty cycle≤2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

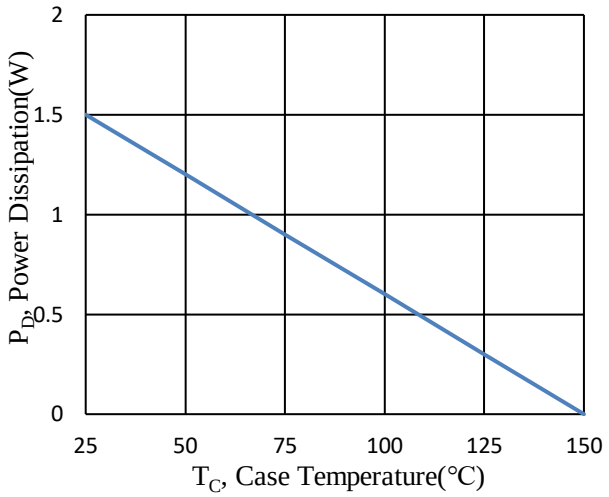


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

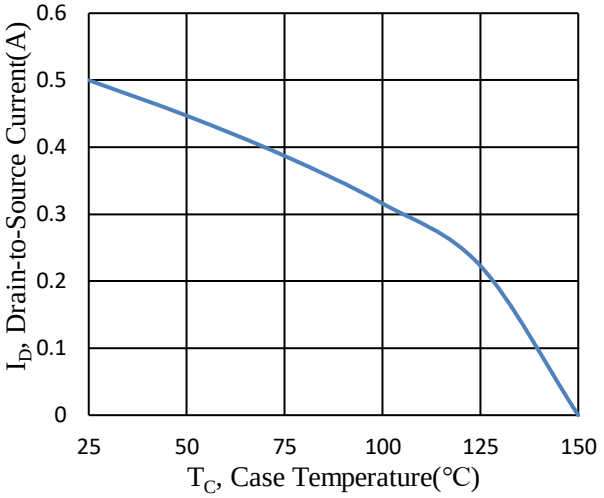


Figure 3. Typical Output Characteristics

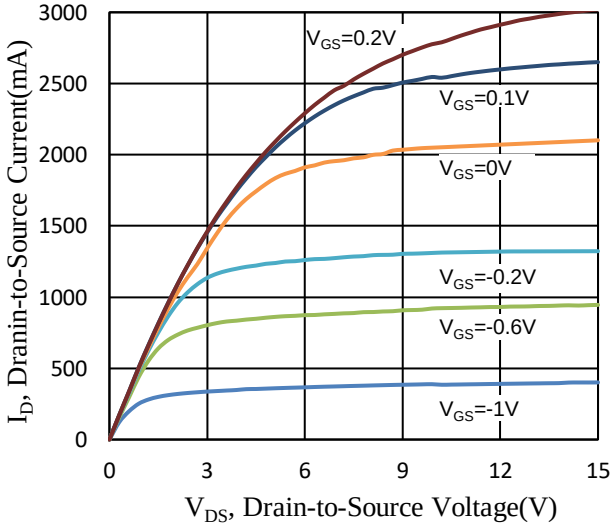


Figure 4. Typical Transfer Characteristics

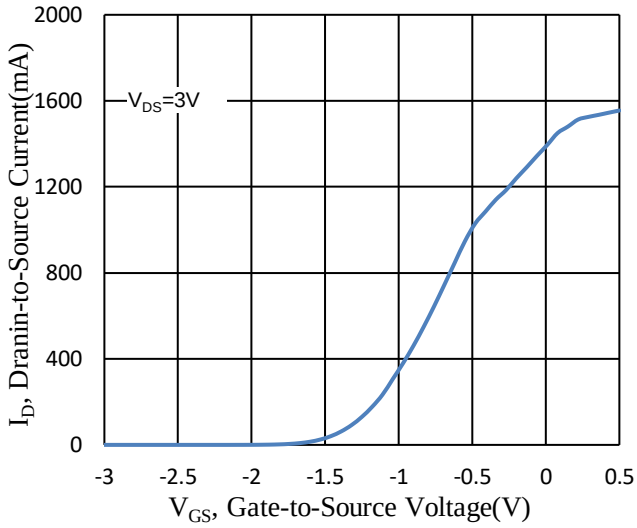


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

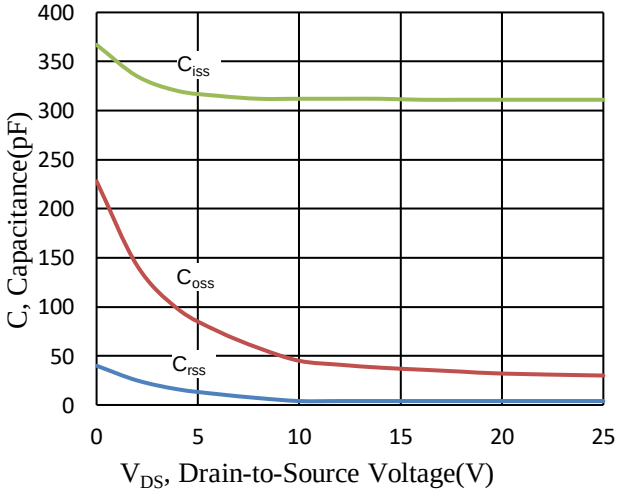


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

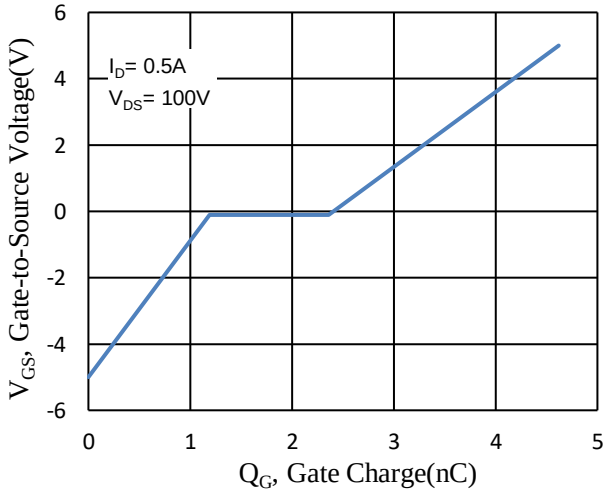


Figure 7. Threshold Voltage vs. Temperature

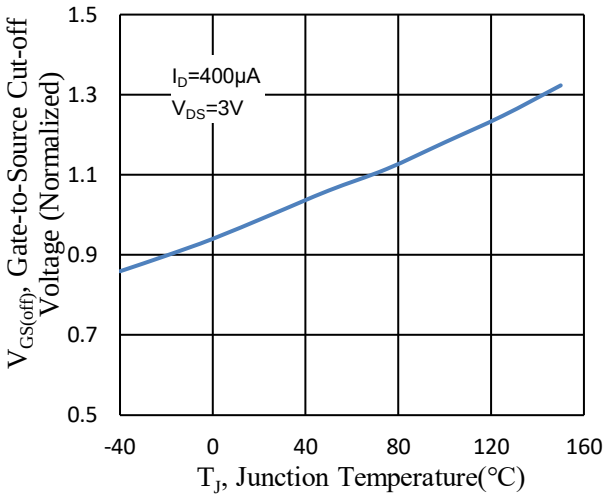


Figure 8. Normalized On-Resistance vs. Junction Temperature

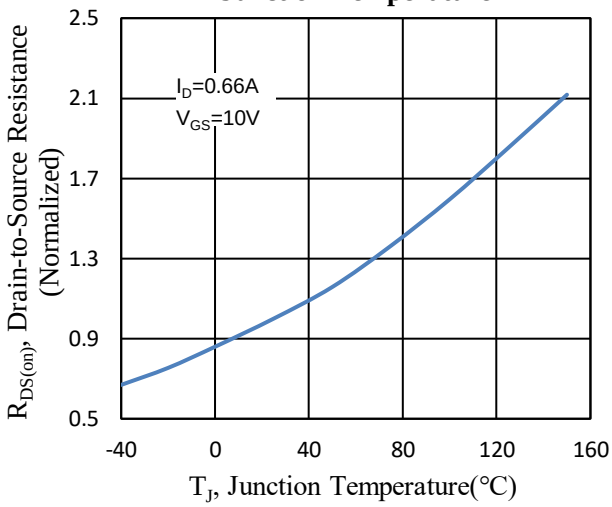


Figure 9. Drain-to-Source Breakdown Voltage vs. Junction Temperature

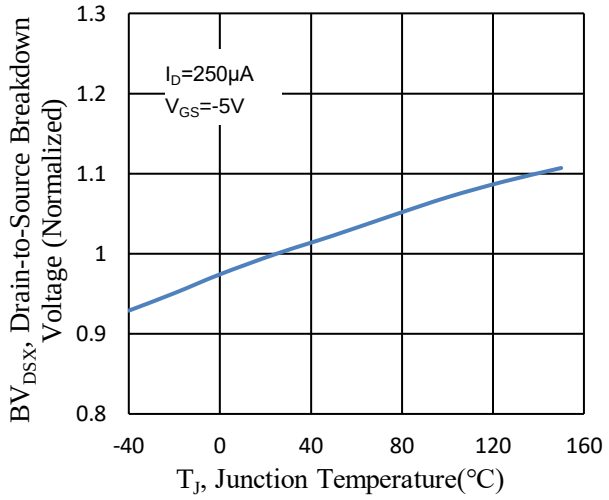
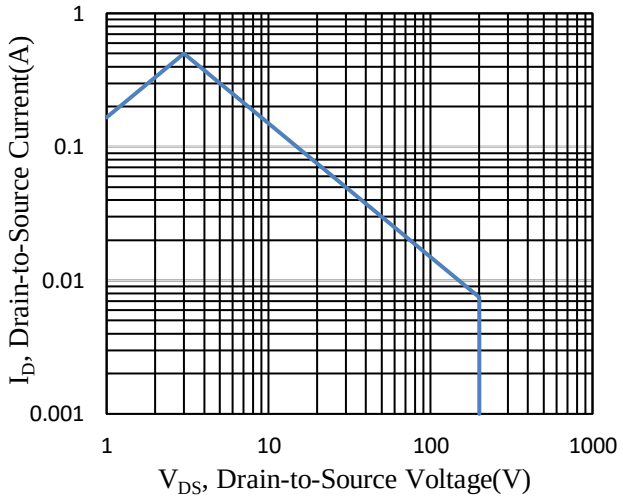
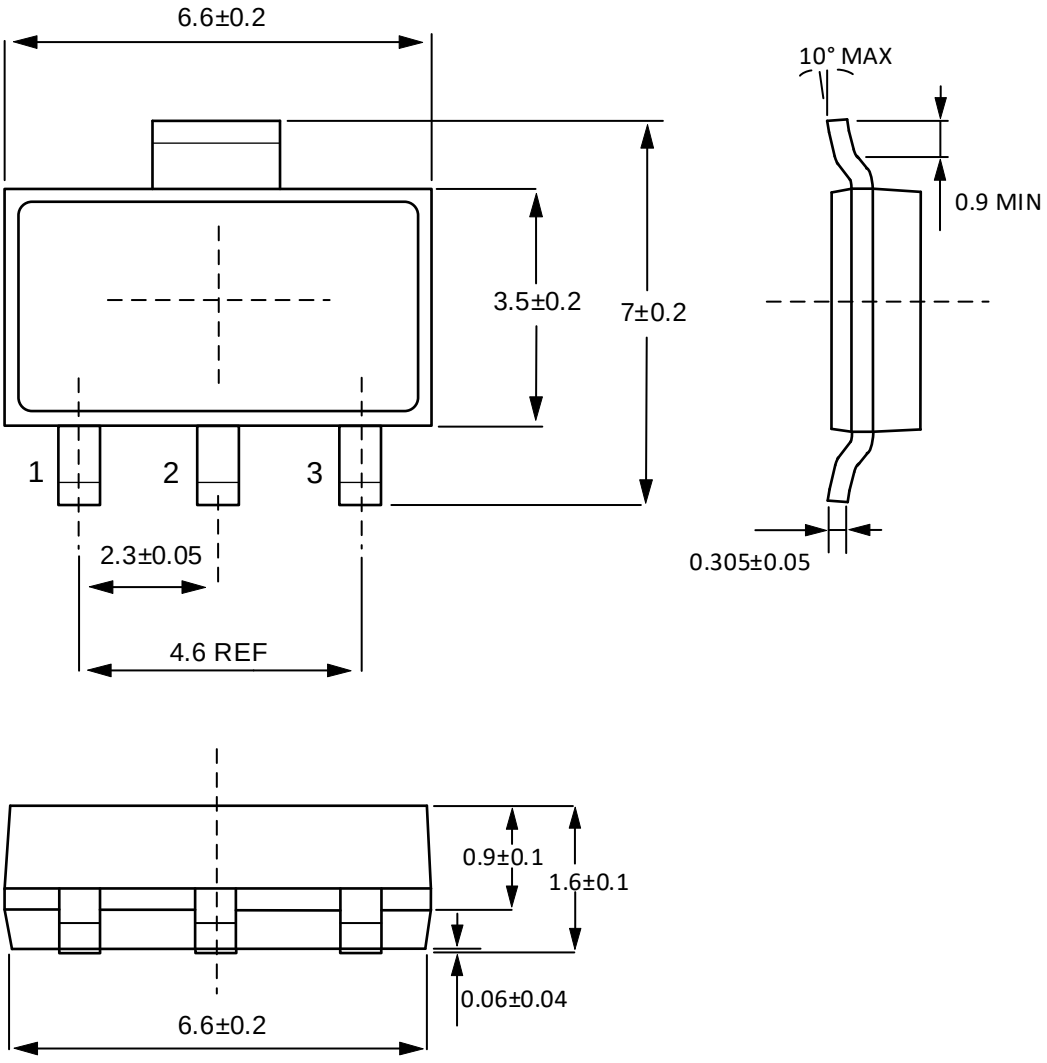


Figure 10. Maximum Forward Safe Operating Area



Package Dimensions

SOT-223



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