

N-Channel, 200V, 6A, POWER MOSFET

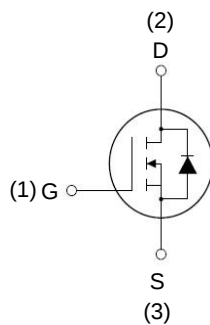
Features

- ✧ New technology for high voltage device
- ✧ Low on-resistance and low conduction losses
- ✧ Small package : TO-252
- ✧ Ultra Low Gate Charge cause lower driving requirements

V_{DS} (V)	Typical $R_{DS(on)}$ (Ω)
200	0.50 @ $V_{GS}=10V$
	0.51 @ $V_{GS}=4.5V$

Applications

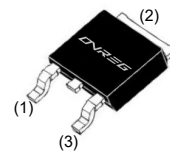
- ✧ PWM application
- ✧ Hard switched and high frequency circuits



Circuit Diagram

Mechanical Data

- ✧ Case : Molded plastic body
- ✧ Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- ✧ Polarity : As marked
- ✧ RoHS/WEEE Compliant



TO-252

Absolute Maximum Rating at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	6	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	4	A
Pulsed Drain Current	I_{DM}	25	A
Maximum Power Dissipation	P_D	60	W
Single pulse avalanche energy (Note 1)	E_{AS}	10.6	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^\circ\text{C}$

Thermal Characteristic

Thermal Résistance, Junction-to-Case	$R_{\theta JC}$	2.1	$^\circ\text{C/W}$
--------------------------------------	-----------------	-----	--------------------

Electrical Characteristics at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	200			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V T _J =25℃			1	μA
		V _{DS} =200V, V _{GS} =0V T _J =125℃			100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1		3	V
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =20A		8		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =2A T _J =25℃		500	578	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =2A T _J =25℃		510	649	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		775		pF
C _{oss}	Output Capacitance			12.5		pF
C _{rss}	Reverse Transfer Capacitance			4.4		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		1.4		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =100V, R _L =25Ω, R _{GEN} =5Ω		13		nS
t _r	Turn-on Rise Time			10		nS
t _{d(off)}	Turn-Off Delay Time			40		nS
t _f	Turn-Off Fall Time			9		nS
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =100V, I _D =4A		12.8		nC
Q _{gs}	Gate-Source Charge			2.1		nC
Q _{gd}	Gate-Drain Charge			2.2		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				6.3	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =4A			1.2	V
t _{rr}	Reverse Recovery Time	I _F =4A, dI/dt=100A/μs		86		ns
Q _{rr}	Reverse Recovery Charge	I _F =4A, dI/dt=100A/μs		290		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=60V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

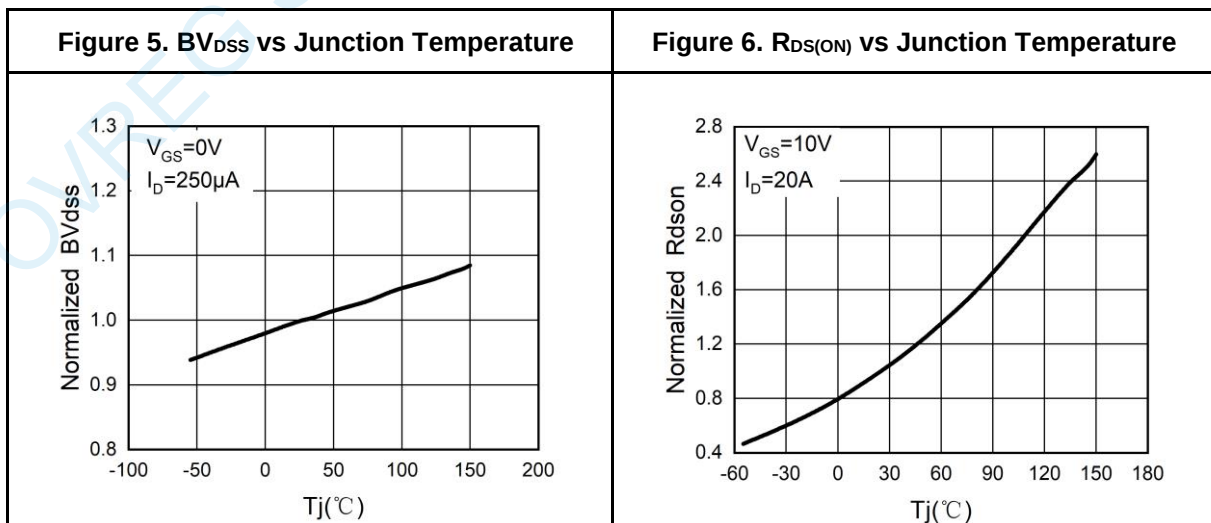
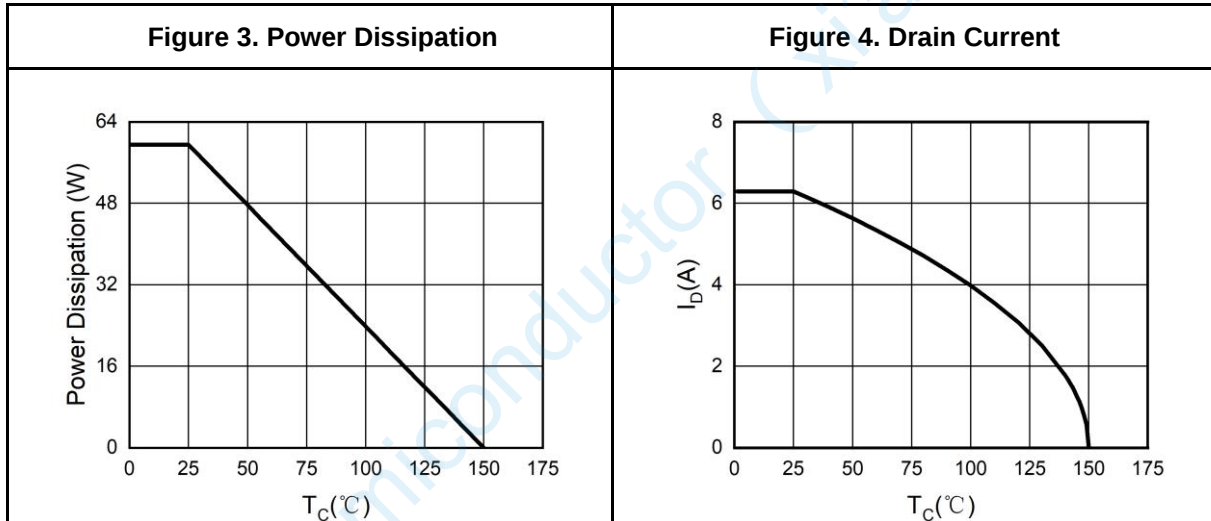
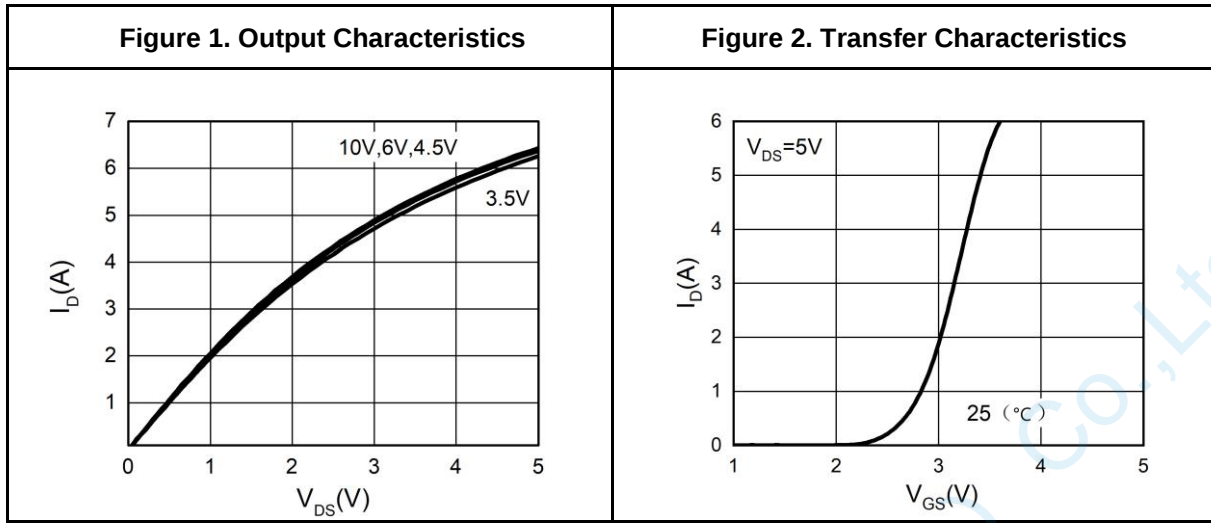


Figure 7. Gate Charge Waveforms

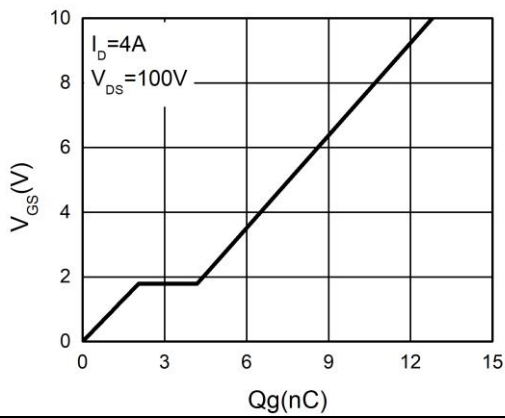


Figure 8. Capacitance

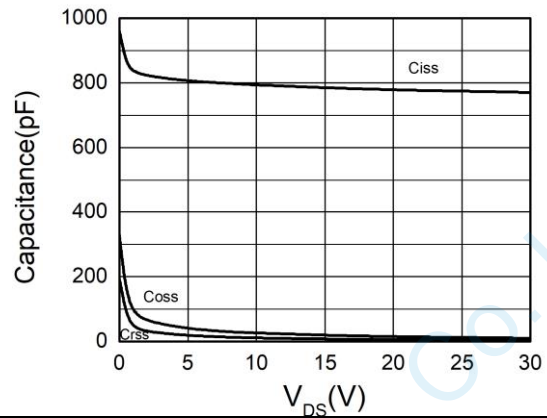


Figure 9. Body-Diode Characteristics

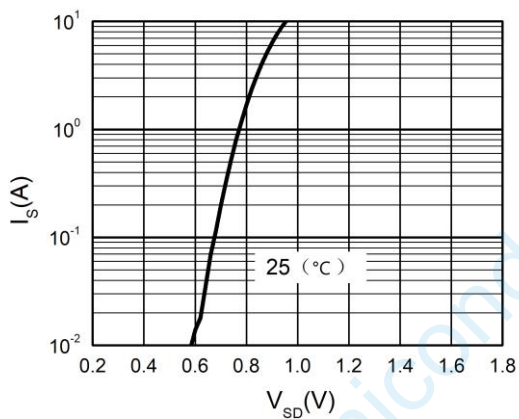
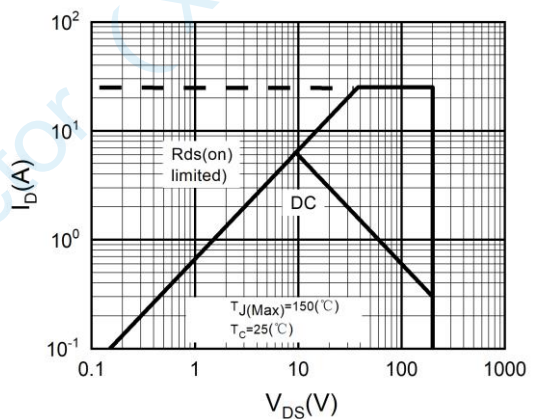
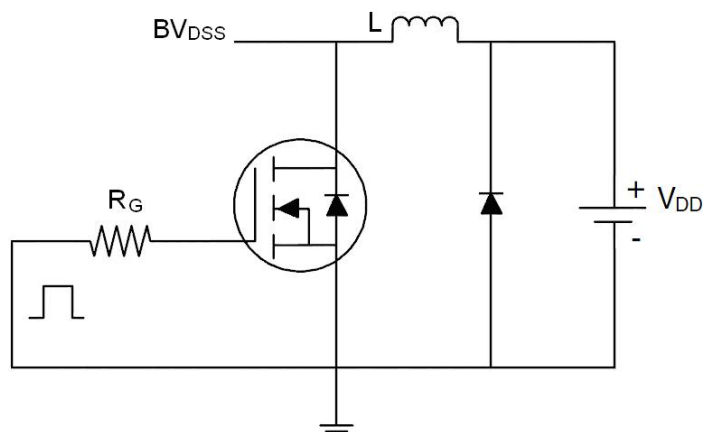


Figure 10. Maximum Safe Operating Area

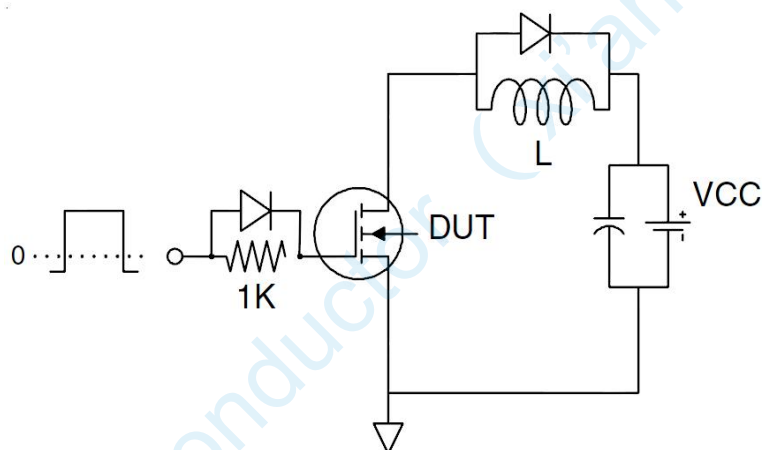


Test Circuit

1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit

