100V N-Channel Power MOSFET

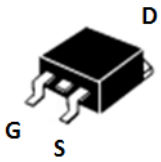
DESCRIPTION：

- Super high dense cell design for extremely low $R_{DS(ON)}$
- High power and current handing capability
- $R_{DS(ON),max.}$=3.0mΩ@V_{GS}=10V
- RoHS compliant

V_{DS}	100V
I_D	209A
$R_{DS(ON)\_MAX}$ @V_{GS}=10V	3mΩ

TYPICAL APPLICATIONS：

- Synchronous Rectification
- Power Management
- Load Switch



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MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	209 132	A
Pulsed Drain Current (1)		I_{DM}	836	A
Power dissipation	Tc=25℃ Derate above 25 C	P_D	236 1.89	W W/℃
Single Pulsed Avalanche Energy	L = 10mH, I_{AS} = 41A, V_{DD} = 24V, R_G = 25Ω, Starting T_J = 25 C	E_{AS}	840	mJ
Single Pulsed Avalanche Current	L = 10mH, I_{AS} = 41A, V_{DD} = 24V, R_G = 25Ω, Starting T_J = 25 C	I_{AS}	41	A
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive rating; pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction – Ambient Junction - Case	$R_{\theta jA}$ $R_{\theta jC}$	62.5 0.53	℃/W

ELECTRICAL CHARATERISTICS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	BV_{DSS}	100			V
Zero Gate Voltage Drain Current VDS = 100 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0		4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		2.5	3.0	mΩ
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		6710		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		1580		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		45		pF
Total Gate Charge VDD= 50V, ID= 20A,VGS= 10V	Q_G		90		nC
Gate to Source Charge VDD= 50V, ID= 20A,VGS= 10V	Q_{GS}		22		nC
Gate to Drain Charge VDD= 50V, ID= 20A,VGS= 10V	Q_{GD}		22		nC
Turn-on delay time VDD=50 V, VGS= 10V, ID= 20A, R_{GEN}=5Ω	td $_{(ON)}$		39		ns
Turn-on Rise time VDD=50 V, VGS= 10V, ID= 20A, R_{GEN}=5Ω	tr		20		ns
Turn-off delay time VDD=50 V, VGS= 10V, ID= 20A, R_{GEN}=5Ω	td $_{(OFF)}$		69		ns
Turn-off Fall time VDD=50 V, VGS= 10V, ID= 20A, R_{GEN}=5Ω	tf		32		ns

Body Diode

Drain to Source Diode Forward Current	I_S			196	A
Drain to Source Diode Forward Voltage [(2)] VGS = 0V, I_S = 1.0A	V_{SD}			1.2	V
Reverse Recovery Time I_F = 20A, di/dt = 100A/us	T_{RR}		107		Ns
Reverse Recovery Charge I_F = 20A, di/dt = 100A/us	Q_{RR}		192		nC

Note 2: Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

Typical Characteristics

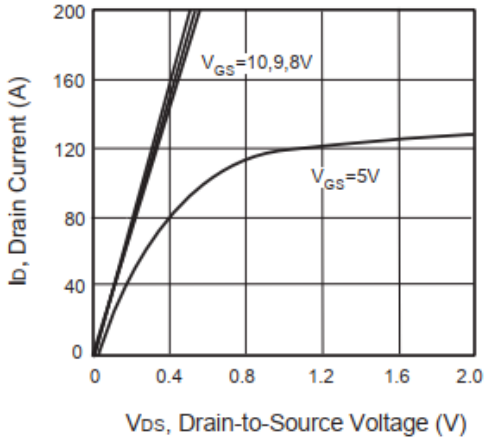


Figure 1. Output Characteristics

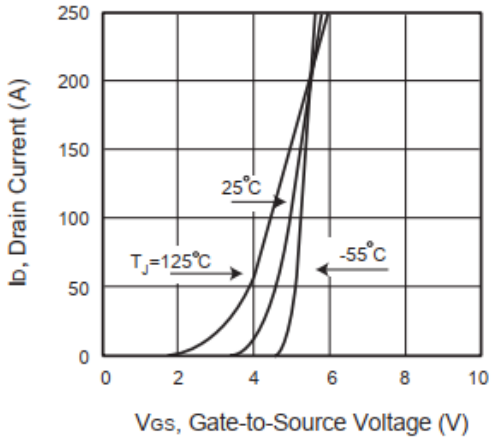


Figure 2. Transfer Characteristics

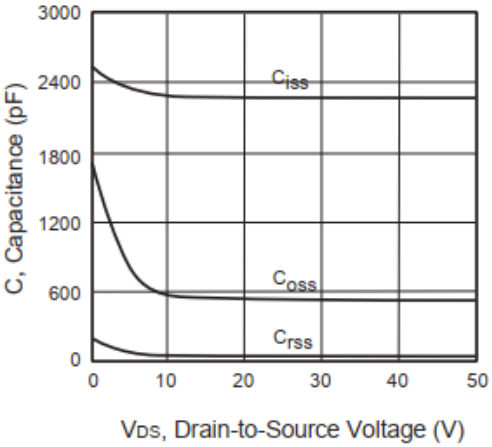


Figure 3. Capacitance

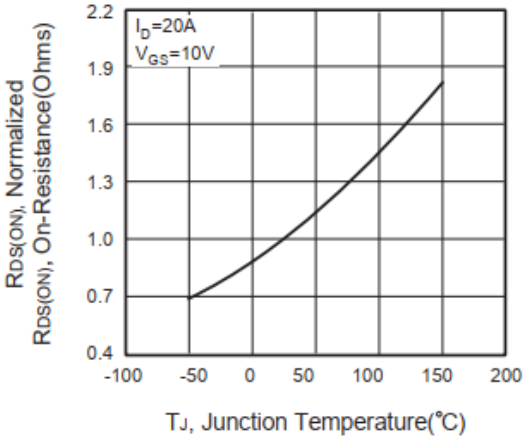


Figure 4. On-Resistance Variation with Temperature

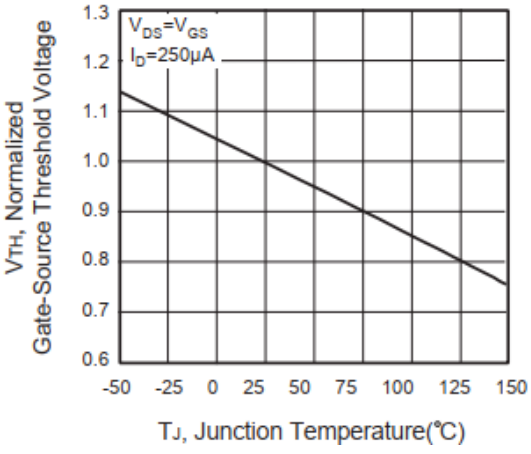


Figure 5. Gate Threshold Variation with Temperature

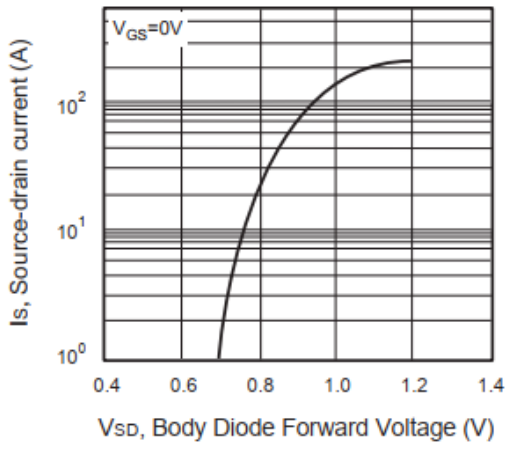


Figure 6. . Body Diode Forward Voltage Variation with Source Curren

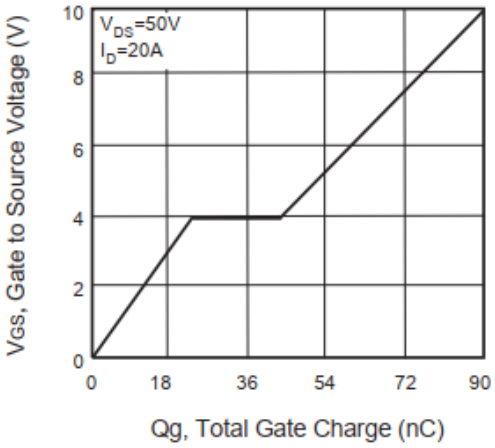


Figure 7. Gate Charge Characteristics

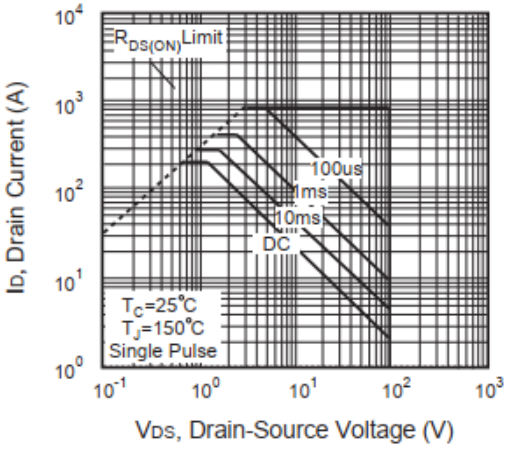


Figure 8. Maximum Safe Operating Area

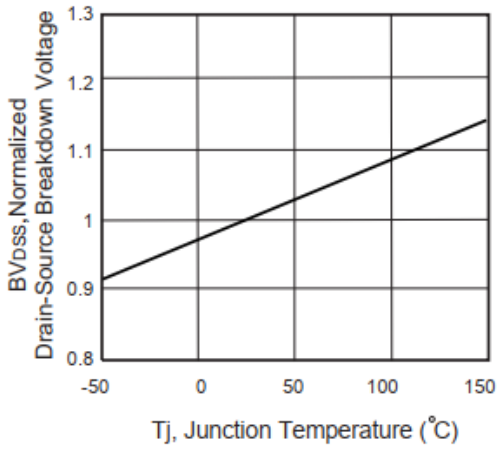


Figure 9. Breakdown Voltage Variation vs. Temperature

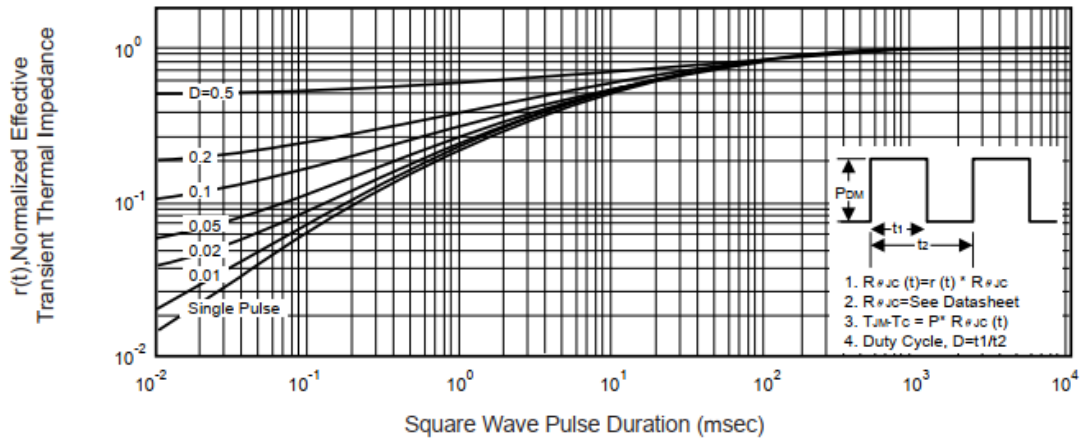
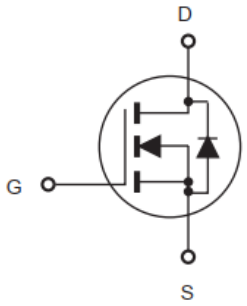


Figure 10. Normalized Thermal Transient Impedance Curve

・Circuit diagram



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