MOSPEC

159N200A

200V N-Channel Power MOSFET

DESCRIPTION：

·Low On-Resistance

·Excellent FoM (figure of merit)

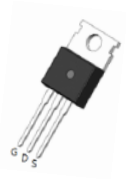
·100% ΔVDS & UIS & Rg Tested

·DC/DC in Telecoms and Inductrial

·Synchronous Rectification in SMPS

·Hard Switching and High Speed Circuit

V_{DSS}	200V
I_D	159A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	8.0mΩ



TO-220

TYPICAL APPLICATIONS：

·Green Molding Compound

·Moisture Sensitivity: Level 1 per J-STD-020

·UL Flammability Classification Rating 94V-0

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

Characteristic	Condition	Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	159 112	A
Pulsed Drain Current (2)		I_{DM}	539	A
Single Pulsed Avalanche Energy (3)		E_{AS}	1674	mJ
Single Pulse Avalanche Current	L= 10.0mH	I_{AS}	70	A
Power dissipation	Tc=25℃ Tc=100℃	P_D	652 326	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes： 1. This current is chip limited, which is calculated based on Rthjc..

2. This current is calculated on single pulse with 10μs Pulse.

3. Defined by design, not subject to production test, EAS condition: TJ=25°C, VDD=100V, VGS=10V, L=1.0mH.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	65 0.45	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	200			V
Zero Gate Voltage Drain Current VDS = 200 V, VGS = 0 V ,Tj=25℃ VDS = 200 V, VGS = 0 V ,Tj=125℃	I_{DSS}			1.0 100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.5	3.4	4.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 80A	$R_{DS(on)}$		8.0	9.2	mΩ
Forward Transconductance VDS = 5.0V, ID = 20A	gfs		58		S
Diode Forward Voltage VGS = 0V, I_{SD} =2.0A	V_{SD}		0.7	1.2	V
Gate Resistance f=1MHz	R_g		2.2		Ω
Input capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{iss}		6100		pF
Output capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{oss}		436		pF
Reverse transfer capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{rss}		15		pF
Turn-on delay time VDS=100 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	td (ON)		19		ns
Rise time VDS=100 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	tr		35		ns
Turn-off delay time VDS=100 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	td (OFF)		59		ns
Fall time VDS=100 V, ID=80A, VGS=10V, R_{GEN}=3.0Ω	tf		37		ns
Total Gate Charge VDS= 100V, ID= 80A, VGS= 10V VDS= 100V, ID= 80A, VGS= 6.0V	Q_G		88 58		nC
Gate to Source Charge VDS= 100V, ID= 80A, VGS= 10V	Q_{GS}		25		nC
Gate to Drain Charge VDS= 100V, ID= 80A, VGS= 10V	Q_{GD}		21		nC
Gate Plateau Voltage VDS= 100V, ID= 80A, VGS= 10V	$V_{plateau}$		4.5		nC
Revers Recovery Time I_F =80A, di_F/dt = 100A/us ,Tj=25℃	Trr		125		ns
Revers Recovery Charge I_F =80A, di_F/dt = 100A/us ,Tj=25℃	Qrr		659		uC
Peak Reverse Recovery Current Tc=25℃	IS			159	A

Typical Performance Characteristics

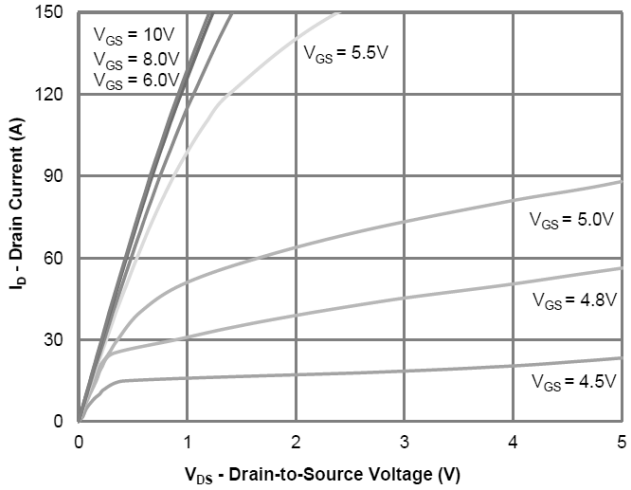


Figure 1. Output Characteristics

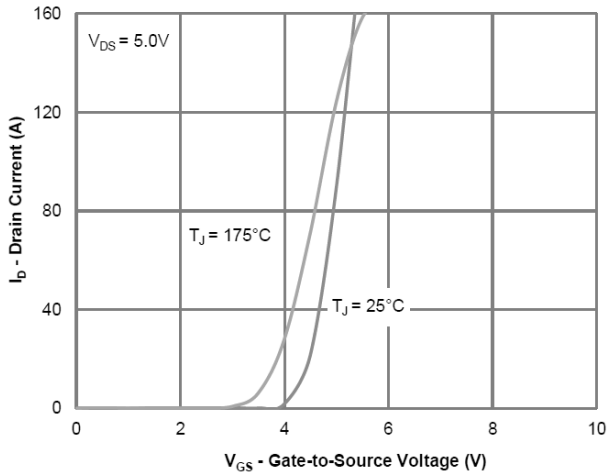


Figure 2. Transfer Characteristics

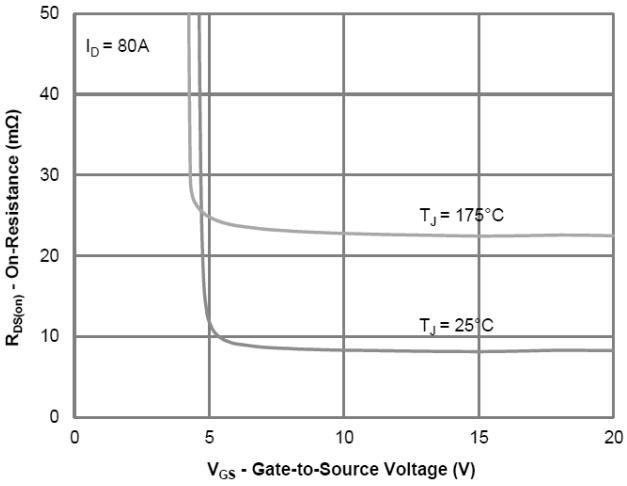


Figure 3. On-Resistance vs. Gate-Source Voltage

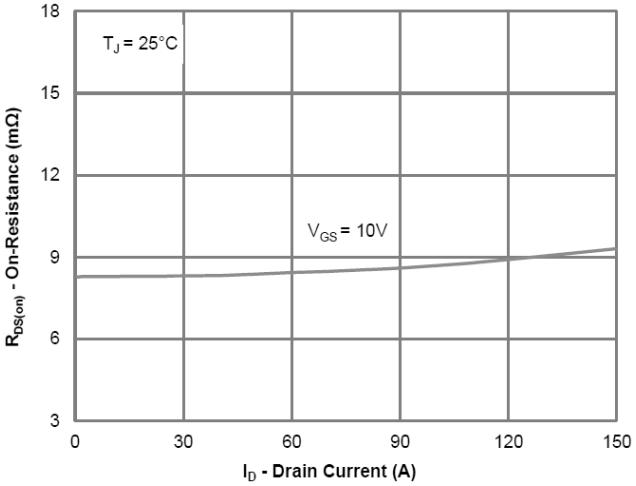


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

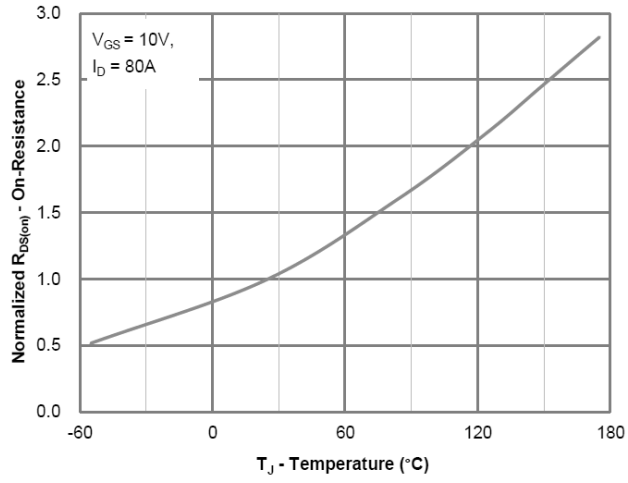


Figure 5. On-Resistance vs. Junction Temperature

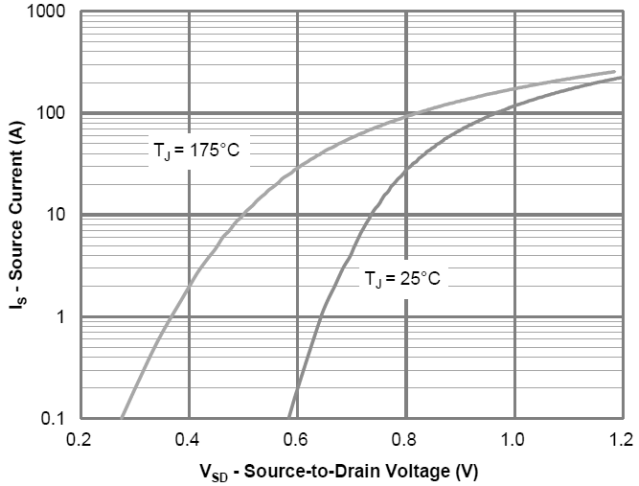


Figure 6. Source-Drain Diode Forward Voltage

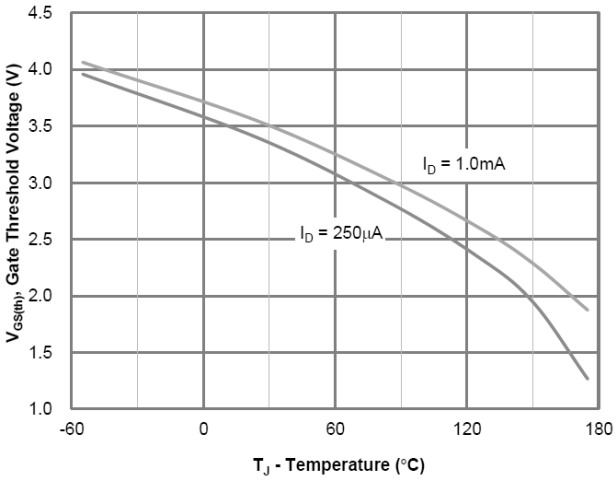


Figure 7. Gate Threshold Variation vs. Junction Temperature

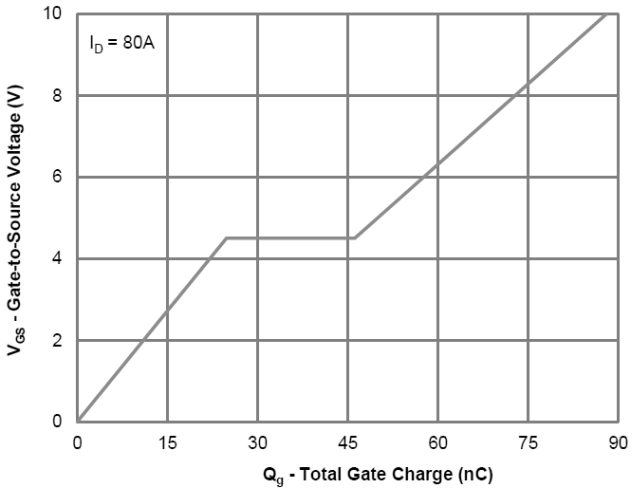


Figure8. Gate Charge Characteristics

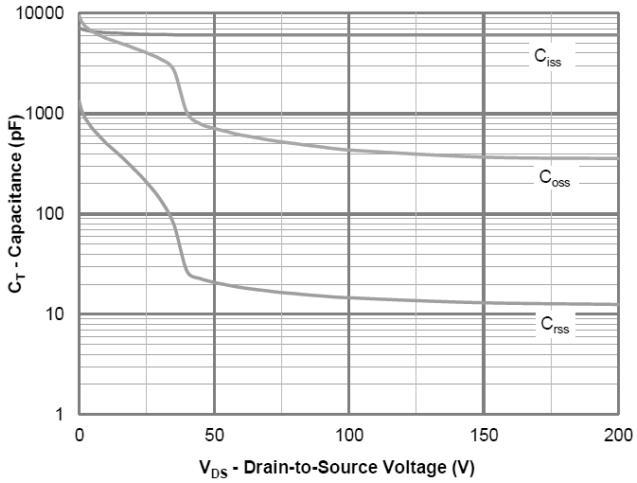


Figure 9. Capacitance Characteristics

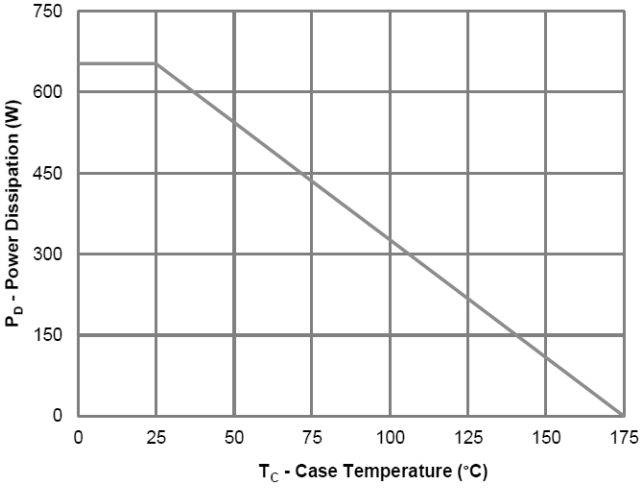


Figure 10. Power Derating

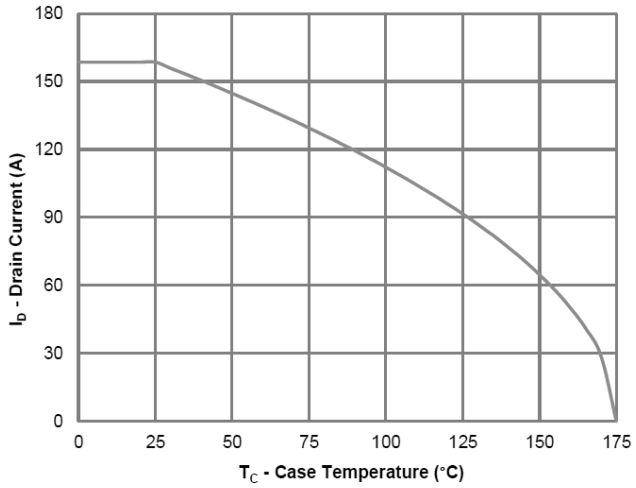


Figure 11. Current Derating

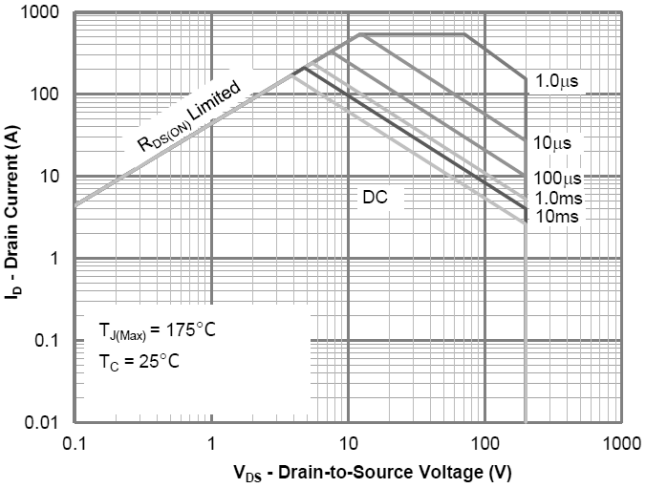


Figure 12. Safe Operating Area

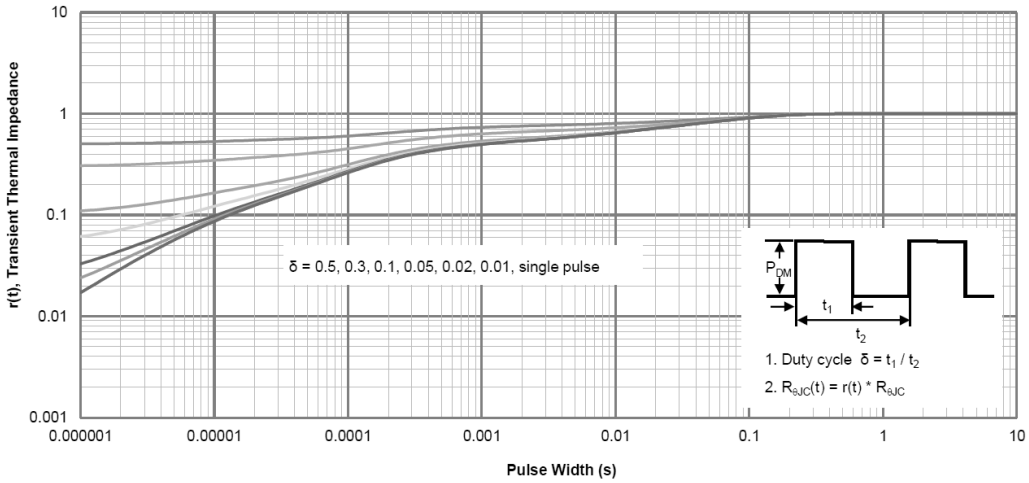
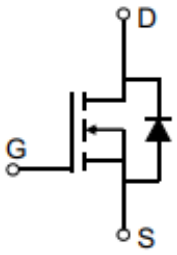
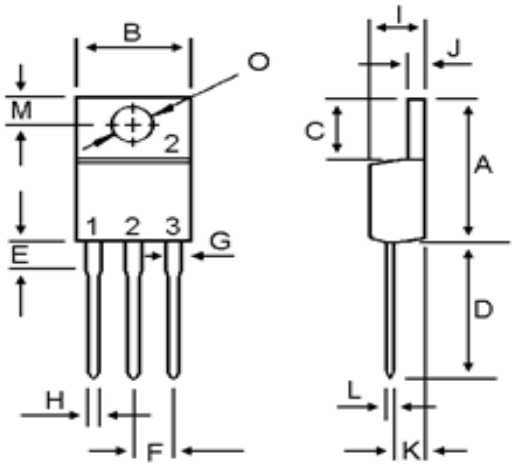


Figure 13. Normalized Maximum Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.80
B	9.70	10.50
C	5.02	6.90
D	12.95	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.70
H	0.69	1.01
I	4.22	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.40	3.00
O	3.40	4.00

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