80V N-Channel Mosfet

FEATURES

- RDS(ON) < 4.5mΩ @ VGS = 10V
- RDS(ON) < 6.5mΩ @ VGS = 6V

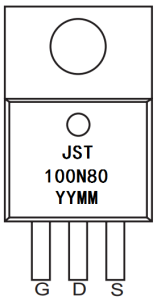
TO-220

1: G
2: D
3: S

APPLICATIONS

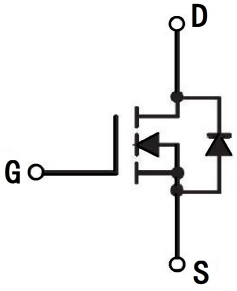
- Load Switch
- PWM Application
- Power management

MARKING



YYMM:Date Code(year&month)

N-CHANNEL MOSFET



MAXIMUM RATINGS (TC=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		80	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	117	A
		T_C = 100℃	88	A
I_{DM}	Pulsed Drain Current note1		400	A
E_{AS}	Single Pulsed Avalanche Energy note2		140	mJ
P_D	Power Dissipation	T_C = 25℃	104	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.2	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

ELECTRICAL CHARACTERISTICS Tc=25 °C unless otherwise specified

Symbol	Param	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V,I_D = 250μA	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 64V, V_{GS} = 0V, T_J = 25℃	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ±20V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D = 250μA	2	3	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note3	V_{GS} =10V, I_D =20A	-	3.0	4.5	mΩ
		V_{GS} =6V, I_D =15A	-	4.0	6.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =40V, V_{GS} = 0V, f = 1.0MHz	-	3884	-	pF
C_{oss}	Output Capacitance		-	2142	-	pF
C_{rss}	Reverse Transfer Capacitance			50	-	pF
Q_g	Total Gate Charge	V_{DS}=40V, I_D=20A, V_{GS}=10V,f=1.0MHz	-	65	-	nC
Q_{gs}	Gate-Source Charge		-	12	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	16	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 40V,V_{GS}=10V I_D =20A, R_G = 4.5Ω	-	11	-	ns
t_r	Turn-On Rise Time		-	24	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	55	-	ns
t_f	Turn-Off Fall Time		-	30	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	117	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	400	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD}=30A	-	-	1.2	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_S =20A, di/dt =100A/μs	-	80	-	ns
Q_{rr}	Reverse Recovery Charge		-	70	-	nC

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

2. EAS condition: T_J=25℃, VDD=40V, VG=10V, L=1mH, RG=25Ω, IAS=16.5A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

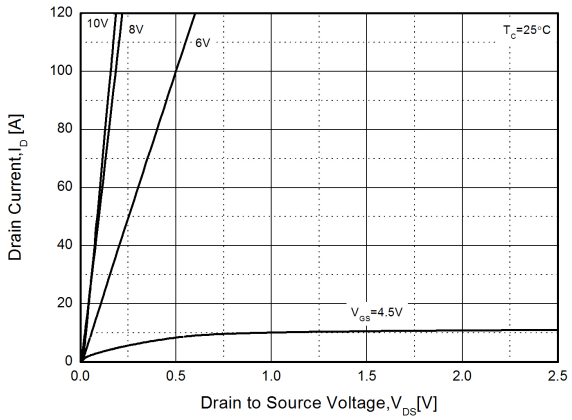


Figure1. Output Characteristics

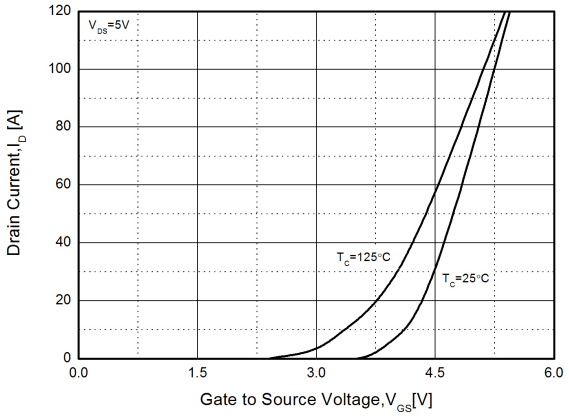


Figure2. Transfer Characteristics

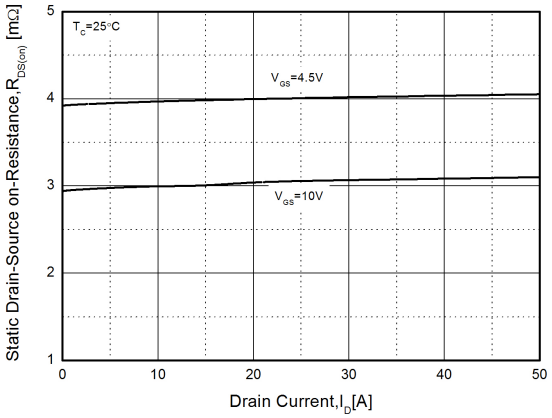


Figure3. Rdson-Drain Current

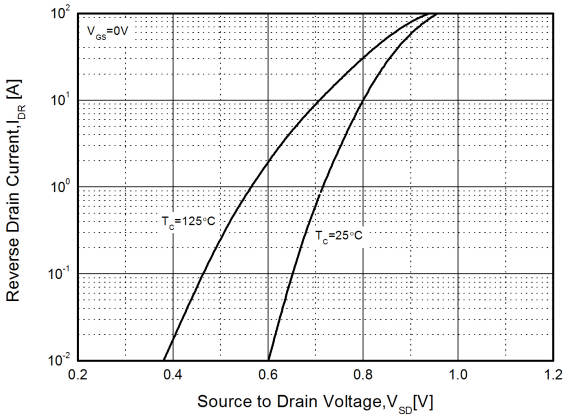


Figure4. Typical Source-Drain Diode Forward Voltage

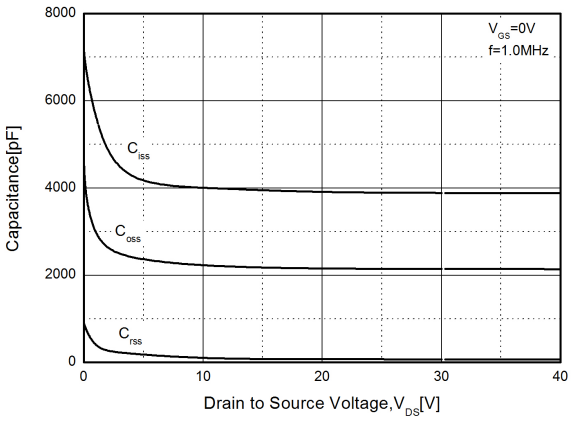


Figure5. Capacitance Characteristics

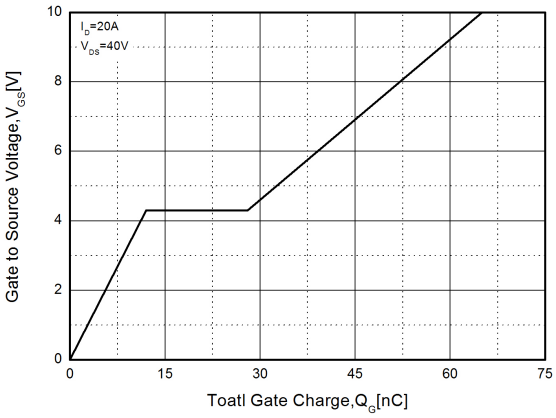


Figure6. Gate Charge

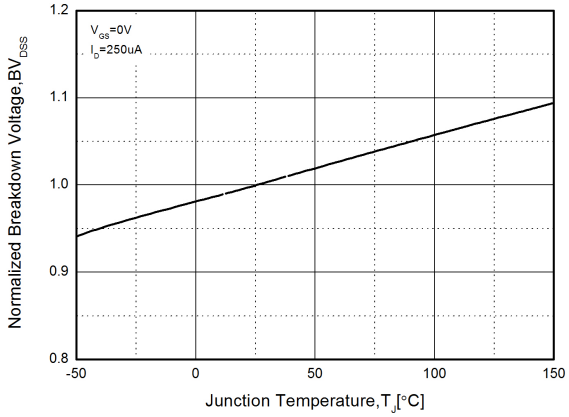


Figure7. Normalized Breakdown Voltage vs. Temperature

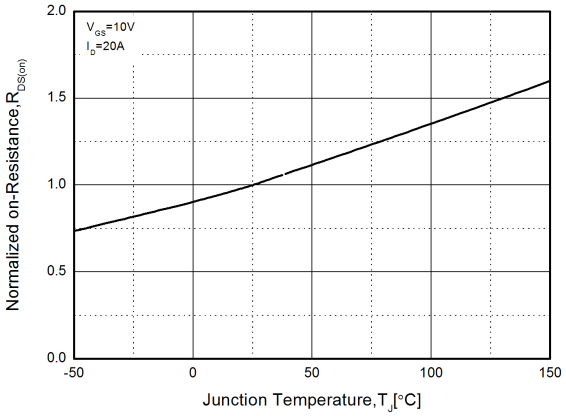


Figure8. Normalized on Resistance vs. Temperature

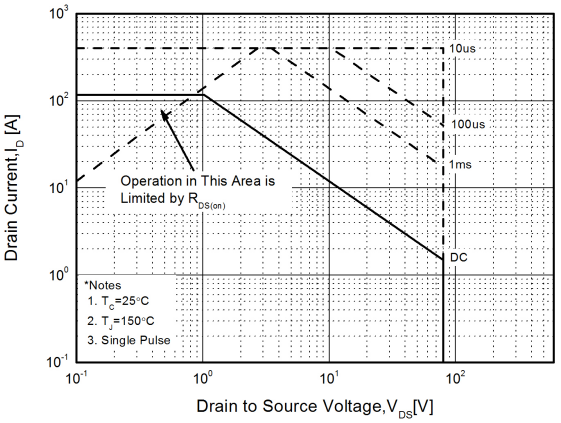


Figure9. Safe Operation Area

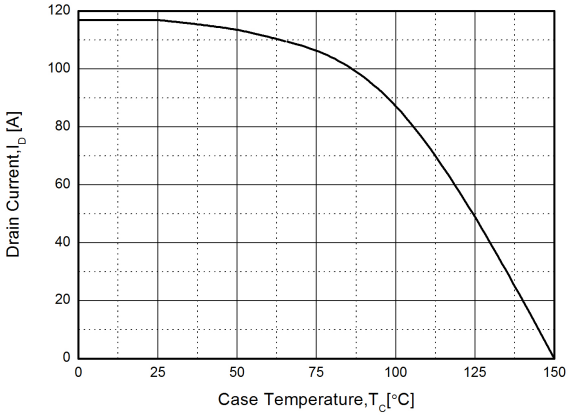


Figure10. Drain Current vs. Case Temperature

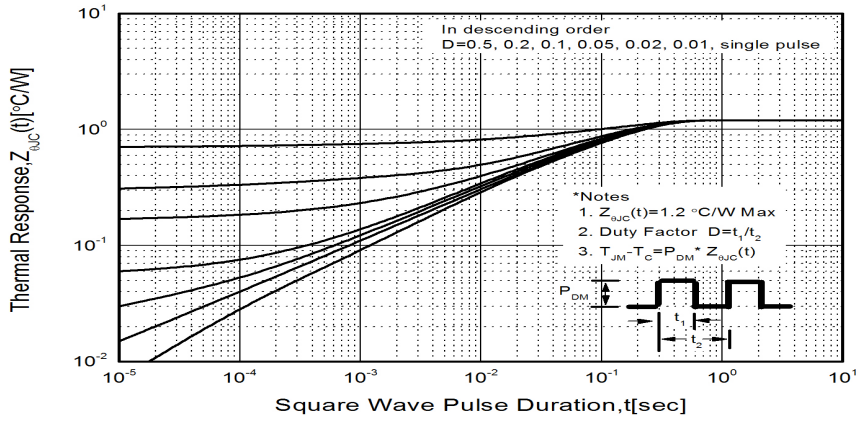
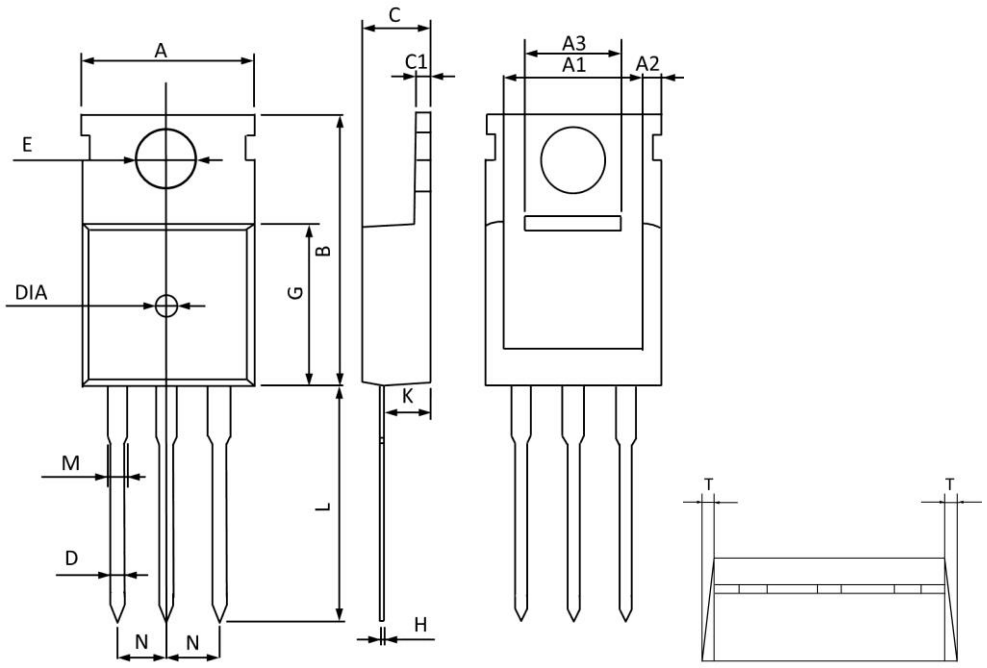


Figure11. Transient Thermal Response Curve

TO-220 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.35		W0.014	
DIA	Φ1.5 TYP.	deep0.2 TYP.	Φ0.059 TYP.	deep0.008 TYP.