

40V N-Channel Mosfet

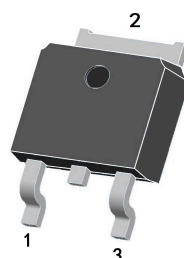
FEATURES

- $R_{DS(ON)} \leq 1.7m\Omega$ (1.3m Ω Typ.)
@ $V_{GS}=10V$
- $R_{DS(ON)} \leq 2.9m\Omega$ (2.2m Ω Typ.)
@ $V_{GS}=4.5V$

APPLICATIONS

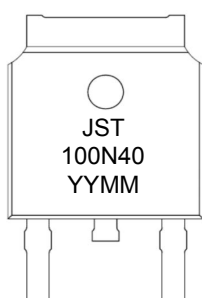
- Motor drivers
- DC-DC Power Converter

TO-252



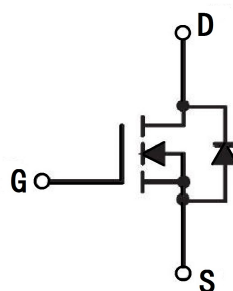
1. GATE
2. DRAIN
3. SOURCE

MARKING



YYMM:Date Code(year&month)

N-CHANNEL MOSFET



MAXIMUM RATINGS ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	125	A
I_{DM}	Pulsed Drain Current ^{note1}	450	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	800	mJ
P_D	Power Dissipation	42	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3	$^{\circ}C/W$
T_J	Junction Temperature	150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to +150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS $T_c=25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 32V, V _{GS} = 0V, T _J = 25°C	-	-	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	1.3	1.8	2.2	V
R _{DS(on)}	Static Drain-Source On-Resistance ^{note3}	V _{GS} =10V, I _D =20A	-	1.3	1.7	mΩ
		V _{GS} =4.5V, I _D =10A	-	2.2	2.9	mΩ
Dynamic Characteristics ^{note4}						
C _{iss}	Input Capacitance	V _{DS} =20V, V _{GS} = 0V, f = 1.0MHz	-	7500	-	pF
C _{oss}	Output Capacitance		-	750	-	pF
C _{rss}	Reverse Transfer Capacitance			380	-	pF
Q _g	Total Gate Charge	V _{DS} =20V, I _D =20A, V _{GS} =10V	-	141	-	nC
Q _{gs}	Gate-Source Charge		-	29	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	12	-	nC
Switching Characteristics ^{note4}						
t _{d(on)}	Turn-On Delay Time	V _{DS} =20V, V _{GS} =10V I _D =20A, R _G = 3.3Ω RL = 1Ω	-	61	-	ns
t _r	Turn-On Rise Time		-	356	-	ns
t _{d(off)}	Turn-Off Delay Time		-	135	-	ns
t _f	Turn-Off Fall Time		-	82	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	125	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	450	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =30A	-	0.7	1.3	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S =20A,	-	40	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt =100A/μs	-	14	-	nC

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

2. EAS condition: $T_J = 25^{\circ}\text{C}$, $L = 1mH$,

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

4. Guaranteed by design, not subject to production testing

Typical Performance Characteristics

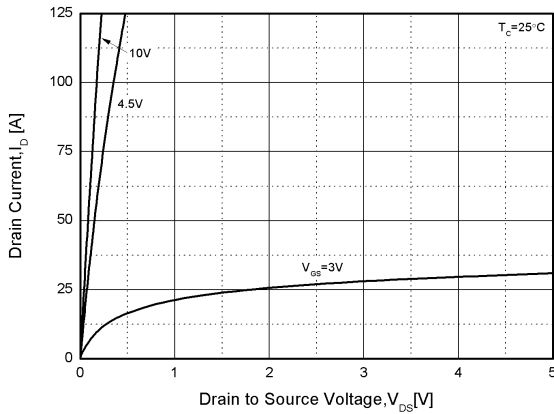


Figure1. Output Characteristics

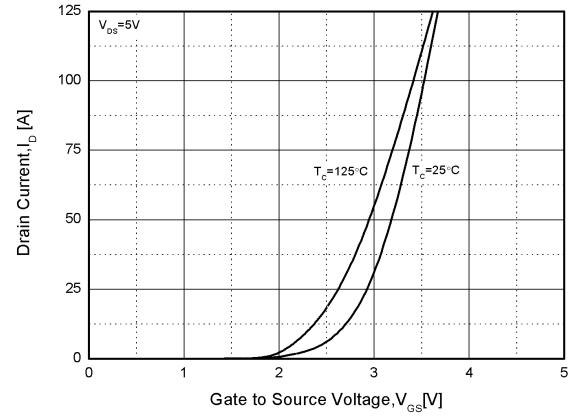


Figure2. Transfer Characteristics

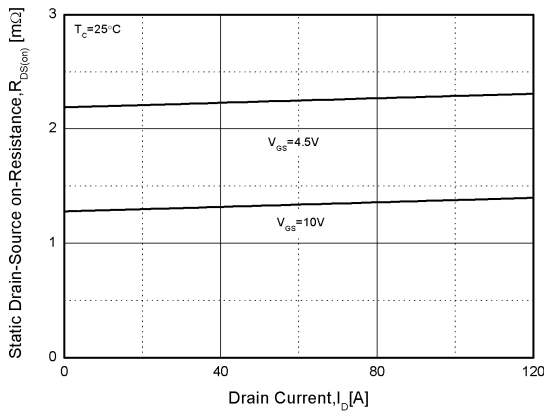


Figure3. Rdson-Drain Current

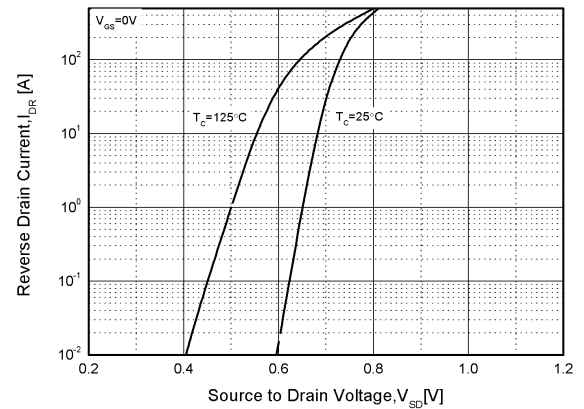


Figure4. Typical Source-Drain Diode Forward Voltage

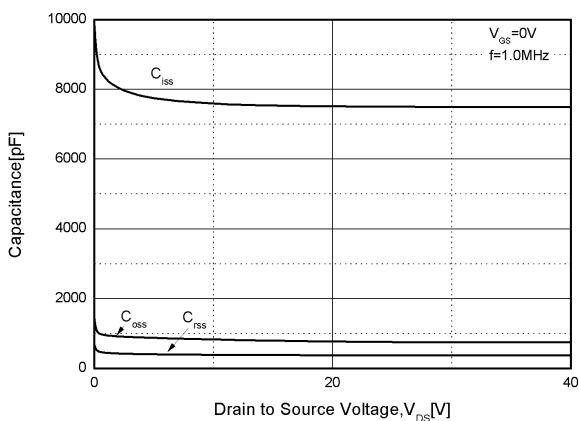


Figure5. Capacitance Characteristics

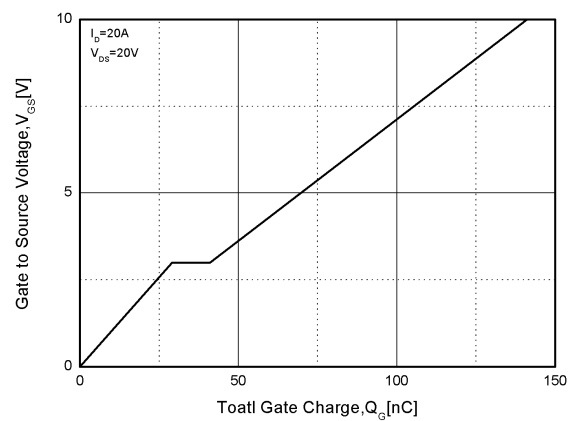


Figure6. Gate Charge

Typical Performance Characteristics (cont.)

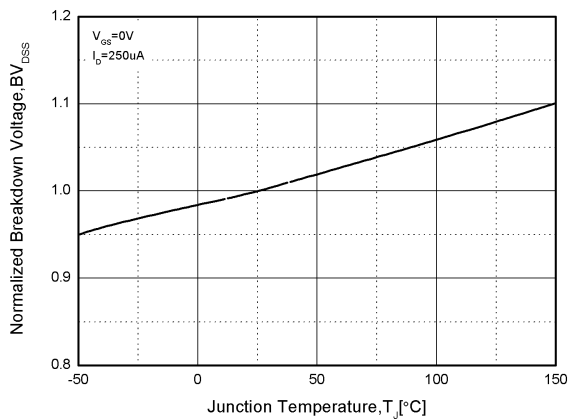


Figure7. Normalized Breakdown Voltage vs. Temperature

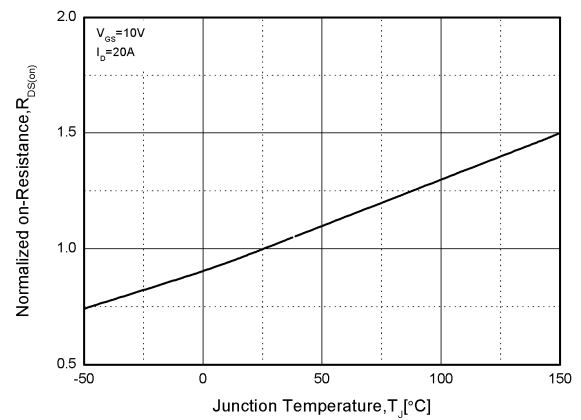


Figure8. Normalized on Resistance vs. Temperature

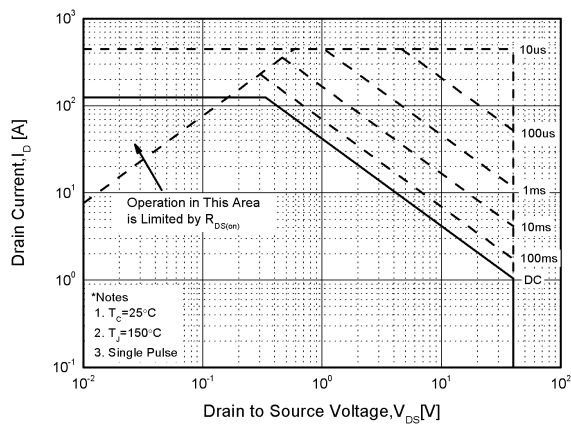


Figure9. Safe Operation Area

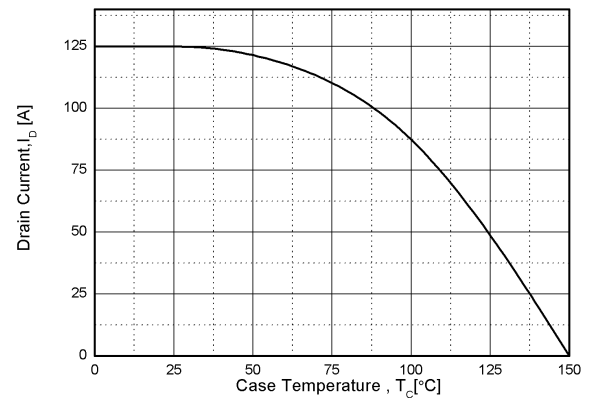


Figure10. Drain Current vs. Case Temperature

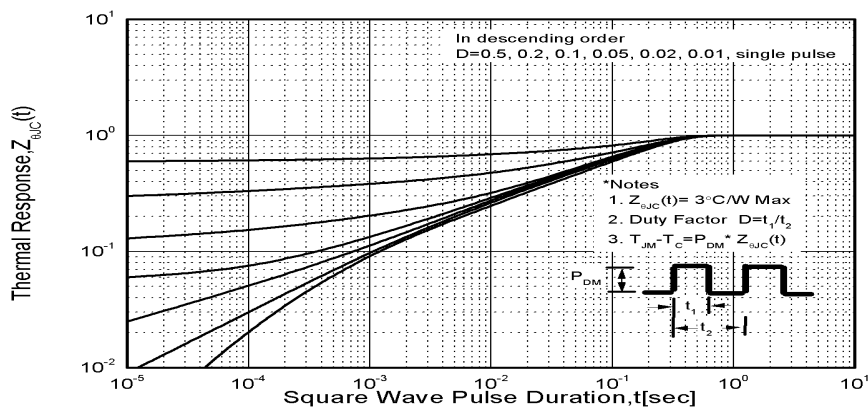
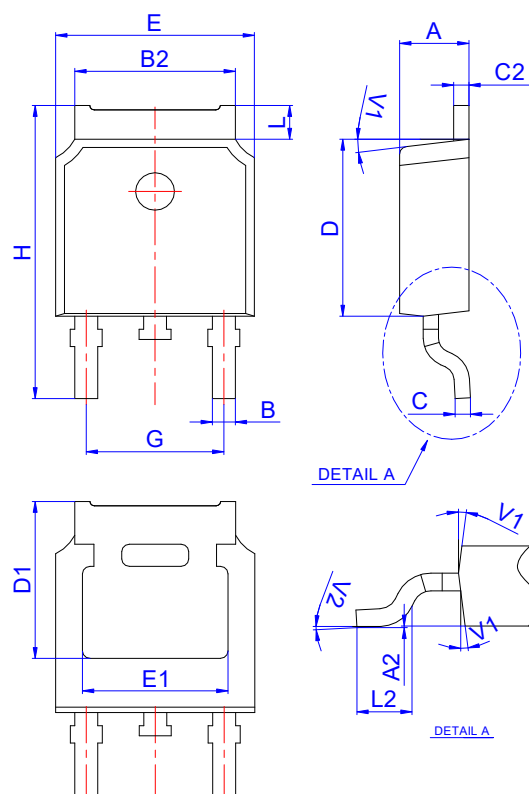


Figure11. Transient Thermal Response Curve

TO-252 PACKAGE OUTLINE DRAWING



Symbols	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°