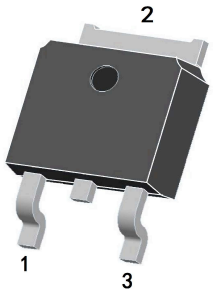
40V N-Channel Mosfet

FEATURES

- $R_{DS(ON)}$ ≤ 3mΩ (2.6mΩ Typ.) @V_{GS}=10V
- $R_{DS(ON)}$ ≤ 5.5mΩ (3.7mΩ Typ.) @V_{GS}=4.5V
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

TO-252

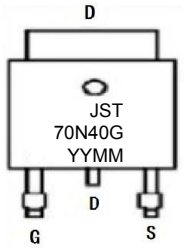


1. GATE
2. DRAIN
3. SOURCE

APPLICATIONS

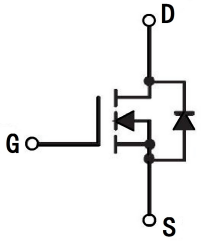
- Automotive electronic pump
- PWM Applications
- Load Switch
- Power Management

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	40	V
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current @V_{GS}=10V	105	A
I_{DM}	Pulsed Drain Current	420	A
P_D	Power Dissipation	60	W
E_{AS}	Single Pulsed Avalanche Energy note1	420	mJ
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.5	℃/W
T_J	Junction Temperature	175	℃
T_{STG}	Storage Temperature Range	-55 to +175	℃

MOSFET ELECTRICAL CHARACTERISTICS Tc=25 °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} = 40V, 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	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note2	V_{GS} =10V, I_D =20A	-	2.6	3	mΩ
		V_{GS} =4.5V, I_D =20A	-	3.7	5.5	mΩ
Dynamic Characteristics note3						
C_{iss}	Input Capacitance	V_{DS} =20V, V_{GS} = 0V f = 1.0MHz	-	2620	-	pF
C_{oss}	Output Capacitance		-	555	-	pF
C_{rss}	Reverse Transfer Capacitance			273	-	pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	2.4	-	Ω
Q_g	Total Gate Charge	V_{DS}=20V, I_D=20A V_{GS}=10V	-	41	-	nC
Q_{gs}	Gate-Source Charge		-	11	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	5.5	-	nC
Switching Characteristics note3						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} =10V, V_{DS}=20V R_G =3Ω, I_D=20A	-	10.2	-	ns
t_r	Turn-On Rise Time		-	23.5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	39	-	ns
t_f	Turn-Off Fall Time		-	17.8	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_{SD}=20A T_J = 25℃	-	-	1.2	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_S =10A di/dt =100A/μs	-	47	-	ns
Q_{rr}	Reverse Recovery Charge		-	54	-	nC

Notes: 1. EAS condition TJ=25℃, VD=20V,VG=10V, ID=41A, L=0.5mH

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

3. Guaranteed by design, not subject to production

TYPICAL PERFORMANCE CHARACTERISTICS

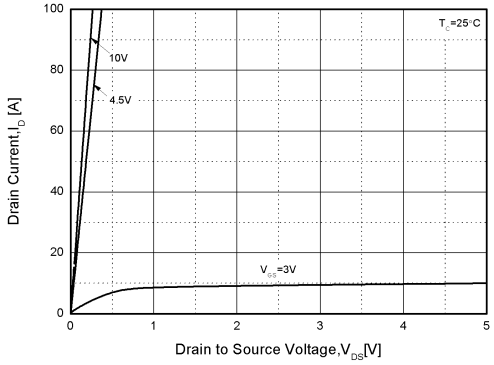


Figure1. Output Characteristics

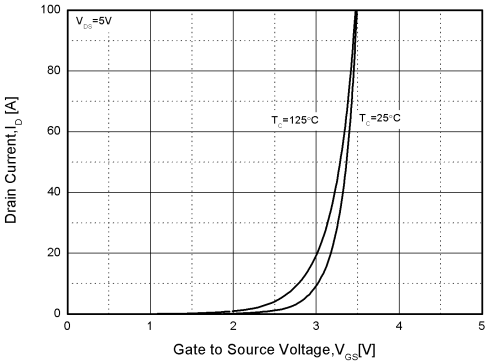


Figure2. Transfer Characteristics

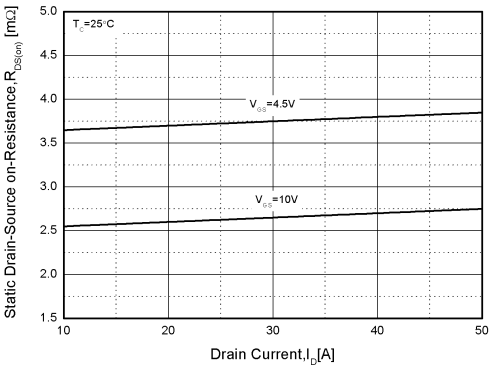


Figure3. Rdson-Drain Current

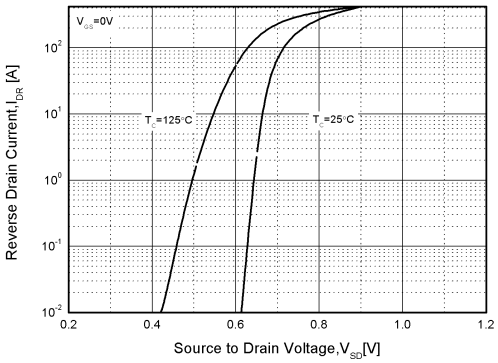


Figure4. Typical Source-Drain Diode Forward Voltage

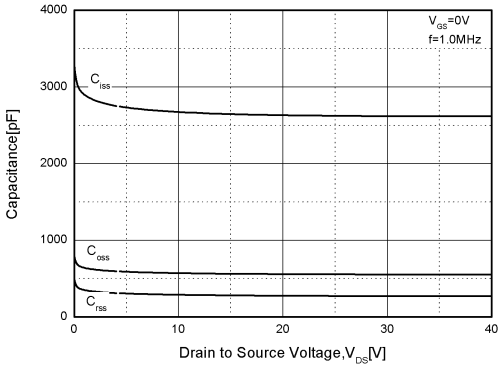


Figure5. Capacitance Characteristics

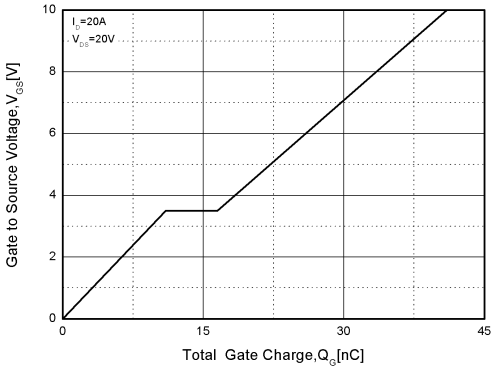


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

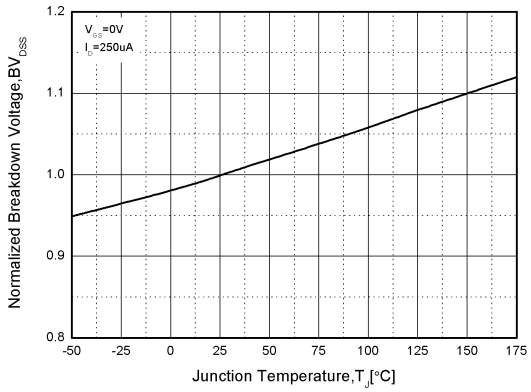


Figure7. Normalized Breakdown Voltage vs. Temperature

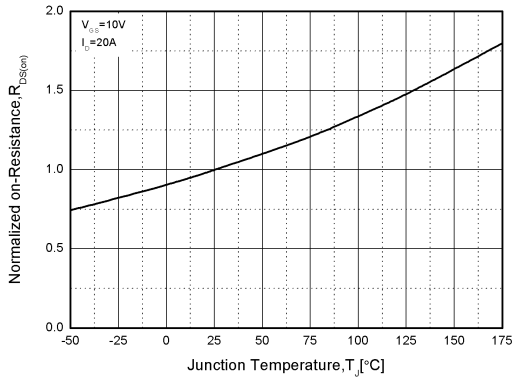


Figure8. Normalized on Resistance vs. Temperature

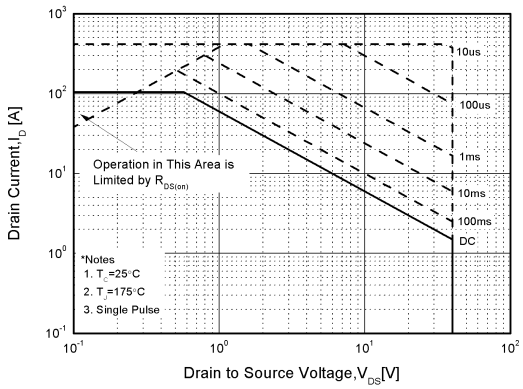


Figure9. Safe Operation Area

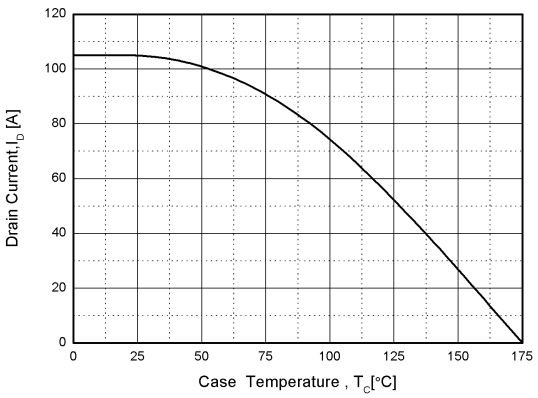


Figure10. Drain Current vs .Case Temperature

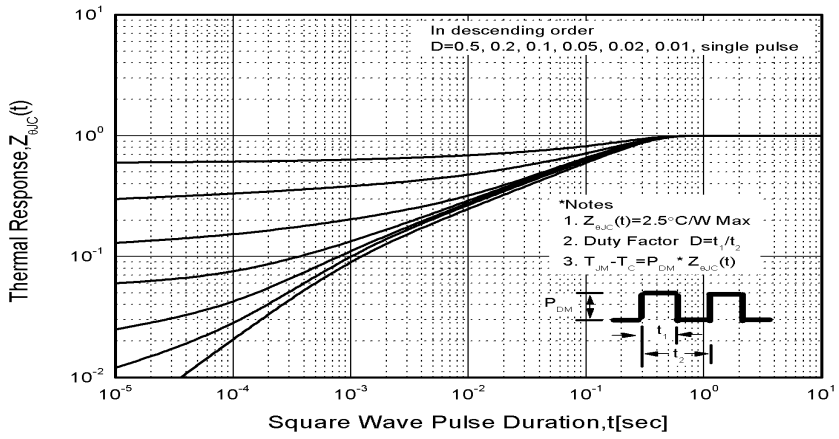
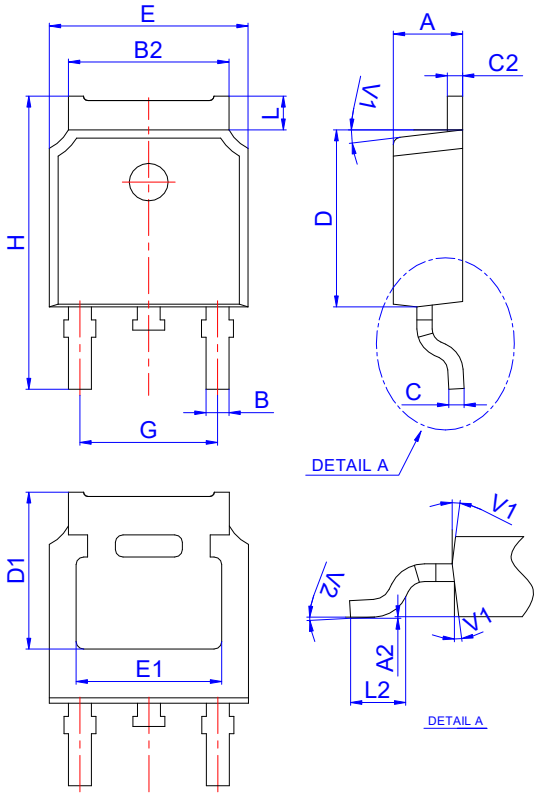


Figure11. Transient Thermal Response Curve

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°