



D2MNM3P4



100V N-Channel MOSFETs

General Description

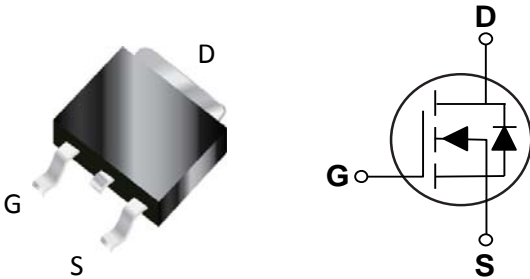
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	3.4 m Ω	175 A

Features

- $R_{DS(ON)} \leq 3.4m\Omega @ V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

TO-263 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications
- Quick Charger

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	175	A
	Drain Current - Continuous ($T_C=100^\circ\text{C}$)	110	
I_{DM}	Drain Current - Pulsed (NOTE 1)	700	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	1250	mJ
IAS	Single Pulse Avalanche Current (NOTE 2)	50	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	290	W
	Power Dissipation - Derate above 25°C	2.32	
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
Marking Code		NM3P4	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.43	$^\circ\text{C/W}$



Electrical Characteristics (T_J=25°C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =80V, V _{GS} =0V, T _J =85°C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A	---	2.8	3.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.0	2.7	4.0	V
gfs	Forward Transconductance	V _{DS} =10V, I _D =3A	---	18	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =80A (NOTE 3 · 4)	---	92	135	nC
Q _{gs}	Gate-Source Charge		---	19	30	
Q _{gd}	Gate-Drain Charge		---	27	40	
T _{d(on)}	Turn-On Delay Time	V _{DD} =50V, V _{GS} =10V, R _G =6Ω, I _D =80A (NOTE 3 · 4)	---	20	30	nS
T _r	Rise Time		---	15	23	
T _{d(off)}	Turn-Off Delay Time		---	60	90	
T _f	Fall Time		---	130	195	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	5600	8400	pF
C _{oss}	Output Capacitance		---	3000	4500	
C _{riss}	Reverse Transfer Capacitance		---	6	9	
R _g	Gate Resistance		V _{DS} =0V, V _{GS} =0V, f=1MHz	---	2	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	175	A
I _{SM}	Pulsed Source Current		---	---	350	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	V _R =100V, I _S =10A, di/dt=100A/μs, T _J =25°C	---	210	---	nS
Q _{rr}	Reverse Recovery Charge		---	600	---	nC

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=1mH, I_{AS}=50A, R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



Characteristics Curves

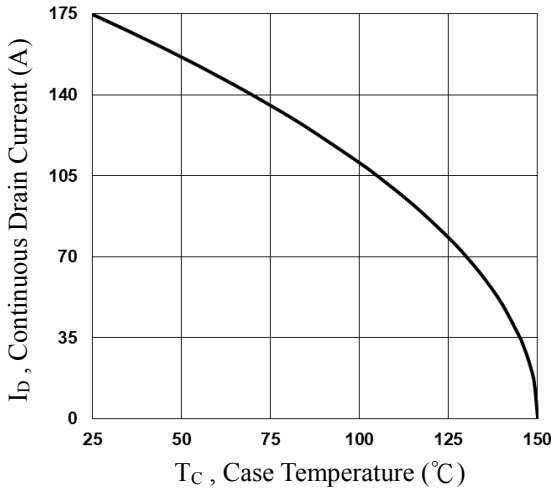


Fig.1 Continuous Drain Current vs. T_c

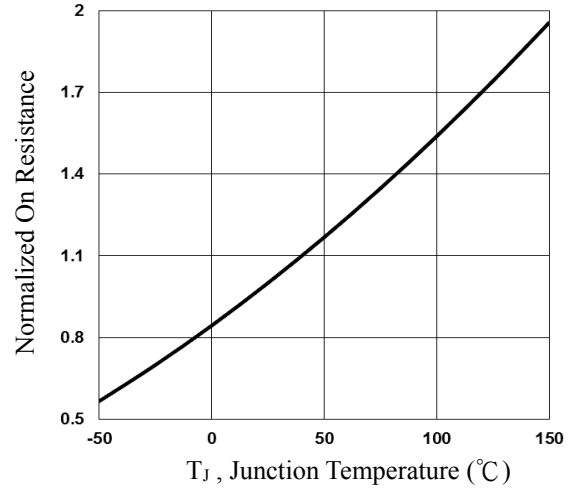


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

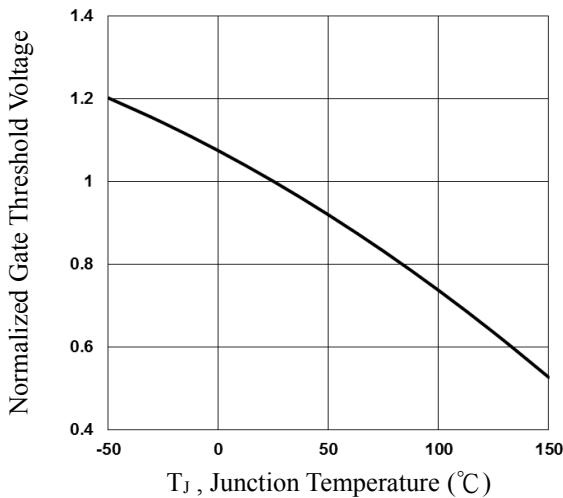


Fig.3 Normalized V_{th} vs. T_j

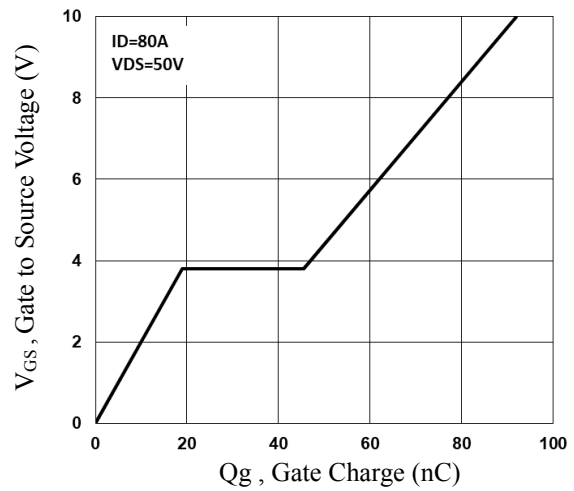


Fig.4 Gate Charge Characteristics

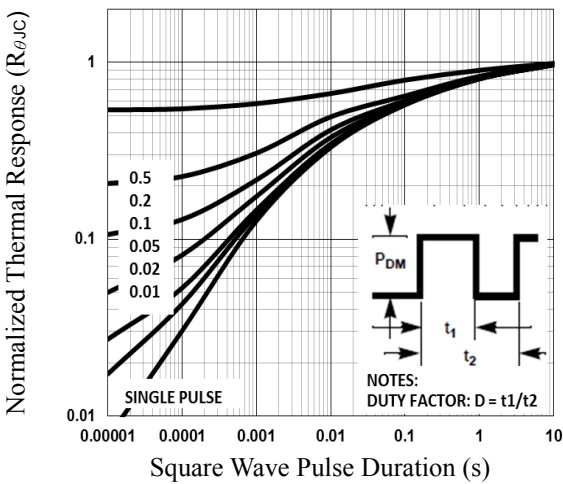


Fig.5 Normalized Transient Impedance

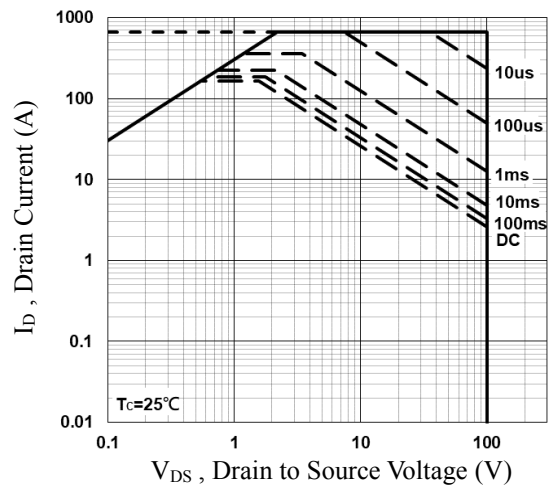


Fig.6 Maximum Safe Operation Area



Characteristics Curves

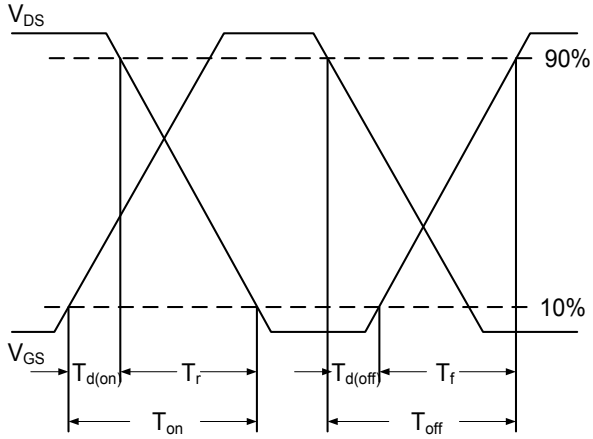


Fig.7 Switching Time Waveform

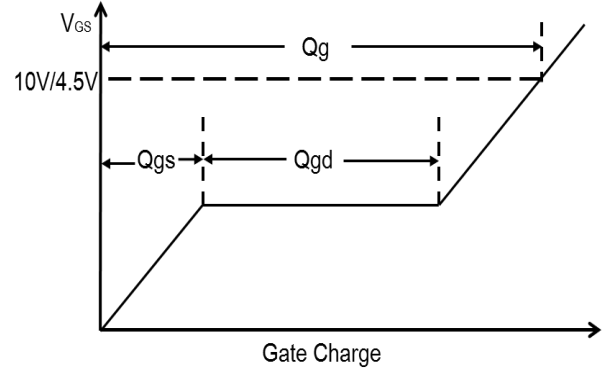
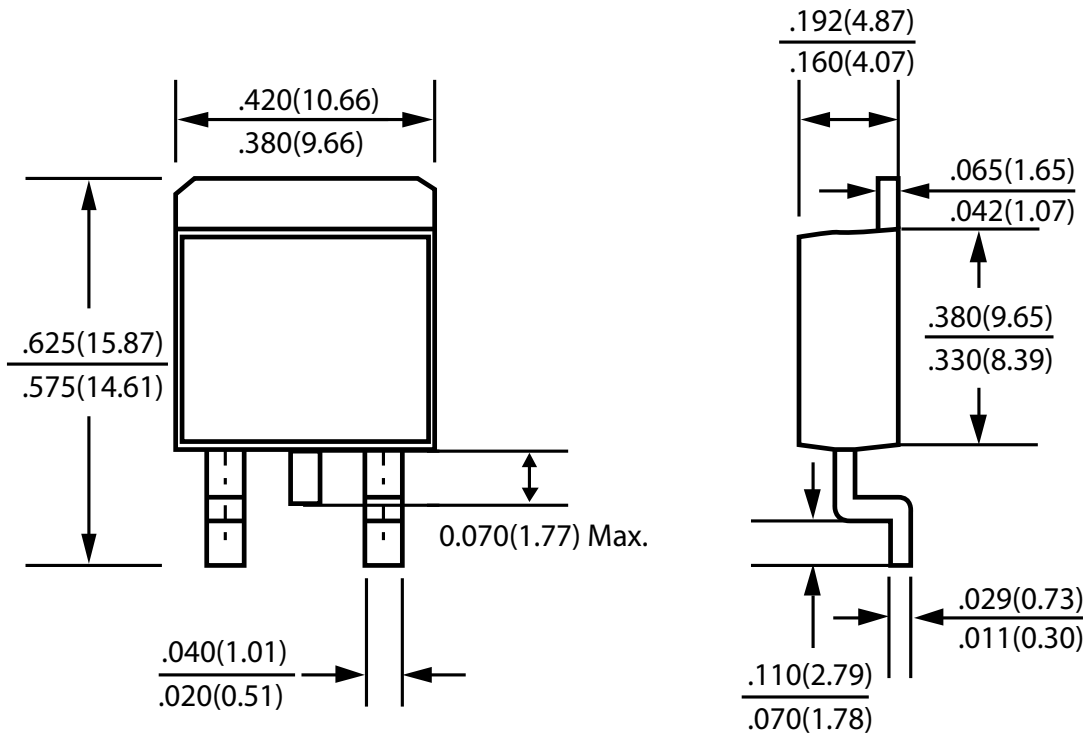


Fig.8 Gate Charge Waveform

Package Outline Dimensions



TO-263

Dimensions in inches and (millimeters)



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