SEMICONDUCTOR

D40N10M

N-Channel 100V 40A trench MOSFET

FEATURES

- TrenchFET Power MOSFET
- 100% Rg tested
- High Current and Power handing capability
- AEC-Q101 qualified And PPAP capable

Pb-Free
RoHS COMPLIANT

Product Summary			
V_{DS}	$R_{DS(on)}$ (mΩ) Typ	I_D (A)	Qg (Typ)
100V	20 @ 10V	20	38nc

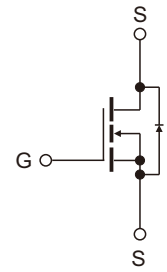
APPLICATIONS

- Load Switch
- Power Management
- PWM Control Circuit

MECHANICAL DATA

- Case:TO-252
- Terminals:Plated solderable per MIL-STD-750,method 2026
- Mounting Position: Any

TO-252



N-channel MOSFET

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameters		Symbol	Value	Unit
Drain-Source voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J =150℃)	T_C=25℃	I_D	40	A
	T_C=100℃		30	
Pulsed Drain Current [1]		I_{DM}	80	A
Maximum Power Dissipation @T_C=25℃		P_D	100	W
Junction and Storge Temperature Range		T_J,T_{STG}	-55 to +150	℃

Thermal Resistance Ratings

Parameters	Symbol	Typ	Max	Unit
Junction to Ambient，Steady State [2]	$R_{\theta JA}$	45	62.5	℃/W
Junction to Case，Steady State [2]	$R_{\theta JC}$	1.0	1.25	

RATINGS AND CHARACTERISTICS OF D40N10M

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
Static [3]						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V,T_C=25℃	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1	-	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=20A	-	20	25	mΩ
		V_{GS}= 6.0V, I_D=20A	-	21	-	
		V_{GS}= 4.5V, I_D=20A	-	23	-	
Forward Transconductance	g_{FS}	VDS=5V, ID=20A	-	50	-	S
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz	-	1880	-	pF
Output Capacitance	C_{oss}		-	145	-	
Reverse Transfer Capacitance	C_{rss}		-	95	-	
Total Gate Charge	Qg	V_{DS}=50V,V_{GS}=10V,I_D=20A	-	26	-	nc
Gate-Source Charge	Qgs		-	7.4	-	
Gate-Drain Charge	Qgd		-	3.8	-	
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=50V, I_D=20A, R_{GEN}=1.6Ω	-	6	-	ns
Rise Time	tr		-	2	-	
Turn-off Delay Time	$t_{D(off)}$		-	18	-	
Fall Time	t_f		-	2	-	
Drain-Source Body Diode Characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	40	A
Diode Forward Voltage [3]	V_{SD}	I_S=40A,V_{GS}=0V	-	-	1.2	V
Body Diode Reverse Recovery Time [3]	trr	I_F=20A, di/dt=100A/μs	-	-	60	ns
Body Diode Reverse Recovery charge	Qrr	I_F=20A, di/dt=100A/μs	-	-	160	nc

Notes: 1.Repetitive rating, pulse width limited by junction temperature T_J(MAX)=150°C
2.Device mounted on FR-4 PCB, 1 inch x 1inch x 0.062 inch.
3.Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

RATINGS AND CHARACTERISTICS OF D40N10M

Typical Performance Characteristics

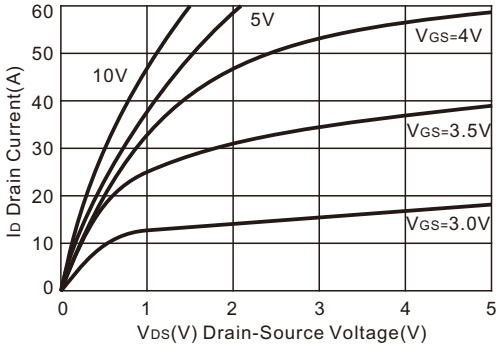


Fig1. Output Characteristics

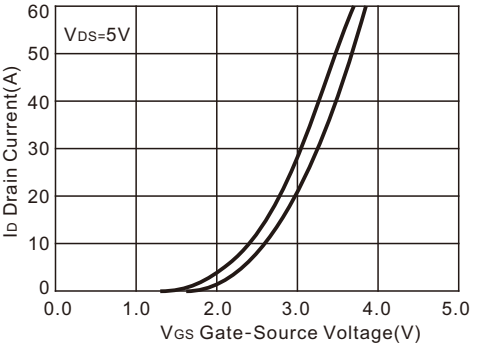


Fig2. Transfer Characteristics

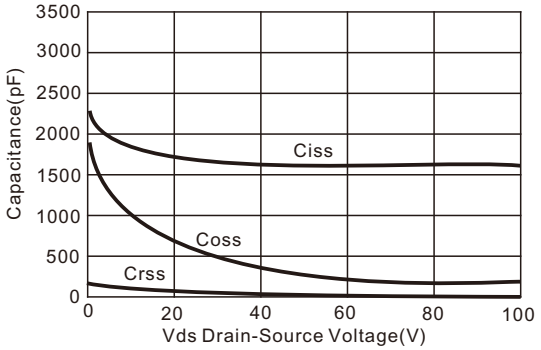


Fig3. Capacitance Characteristics

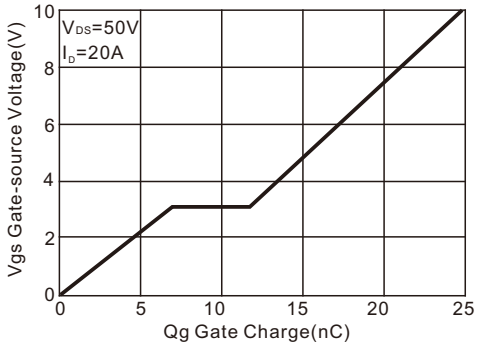


Fig4. Gate Charge

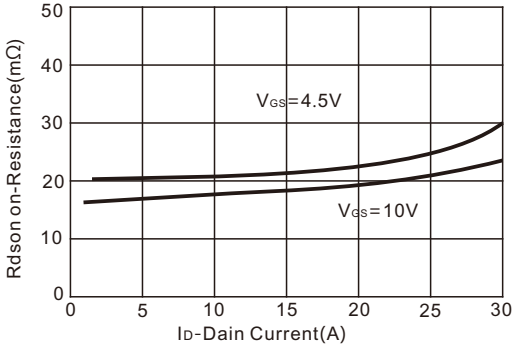


Fig5. Drain-Source on Resistance

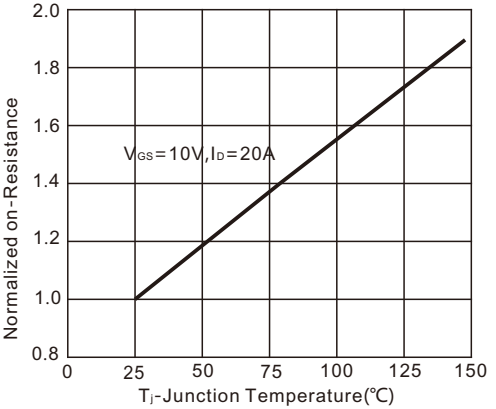


Fig6. Drain-Source on Resistance

RATINGS AND CHARACTERISTICS OF D40N10M

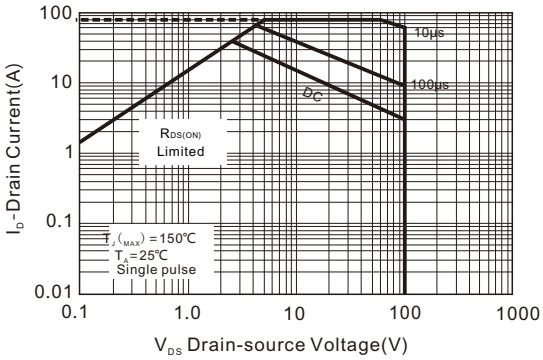


Fig7. Safe Operation Area

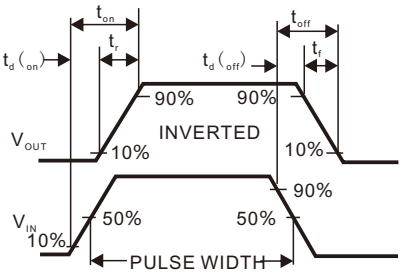
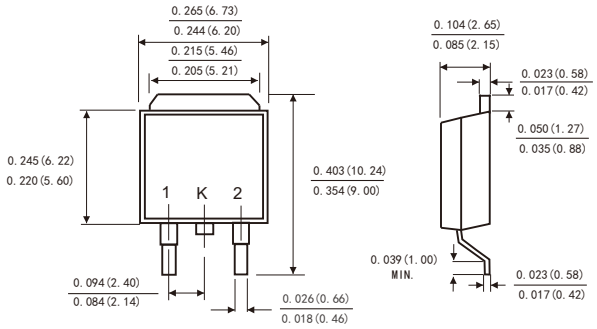


Fig8. Switching wave

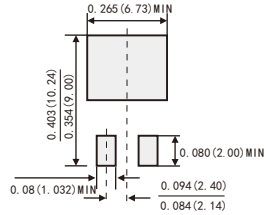
PACKAGE OUTLINE DIMENSIONS

TO-252



Suggested Pad Layout

(TO-252)



Dimensions in inches and (millimeters)